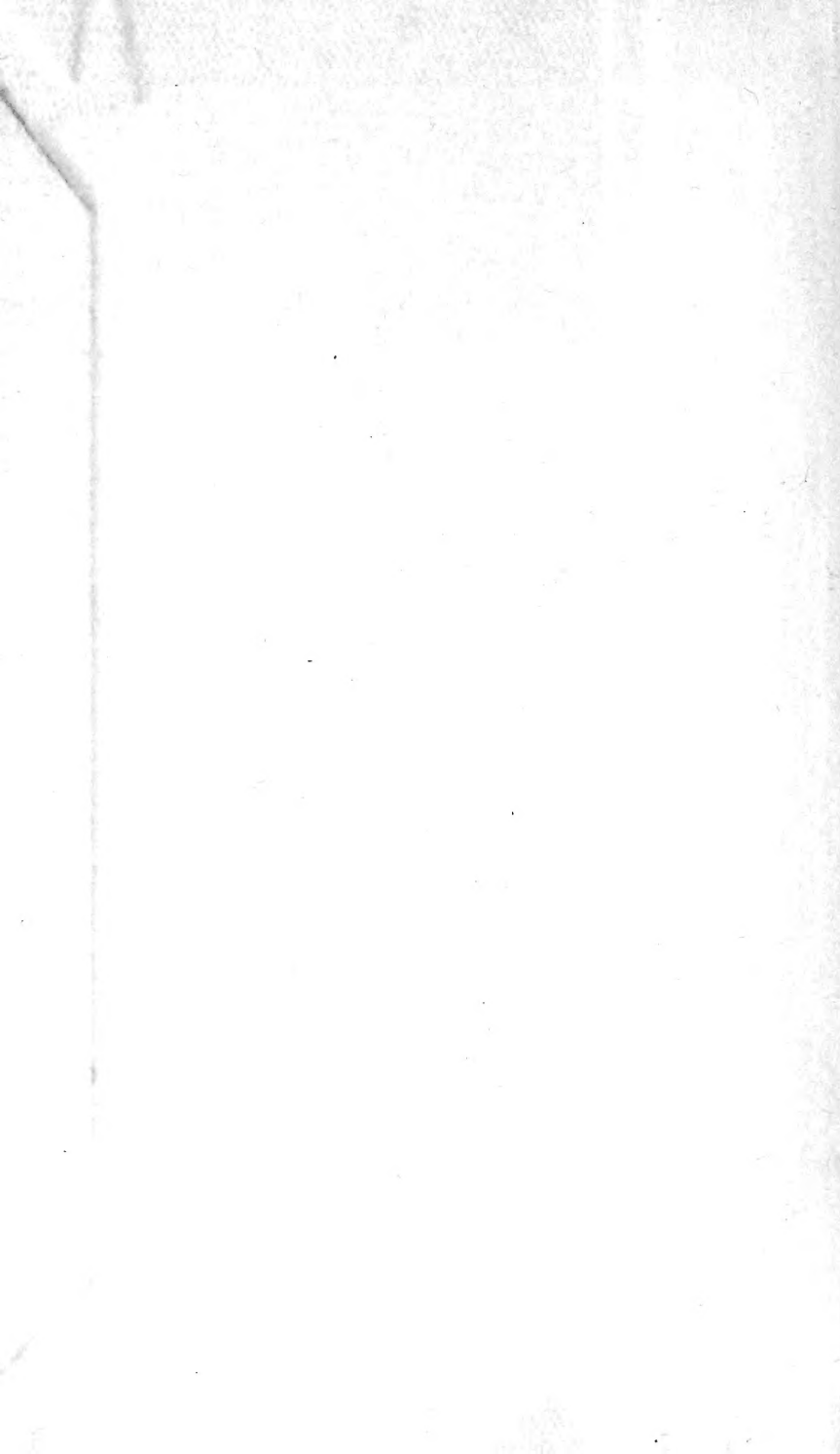


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English-speaking Conference

ON

Infant Mortality:

Report of the Proceedings of the English-speaking Conference on Infant Mortality, held at Caxton Hall, Westminster, on August 4 and 5, 1913.

President—The RIGHT HON. JOHN BURNS, M.P.

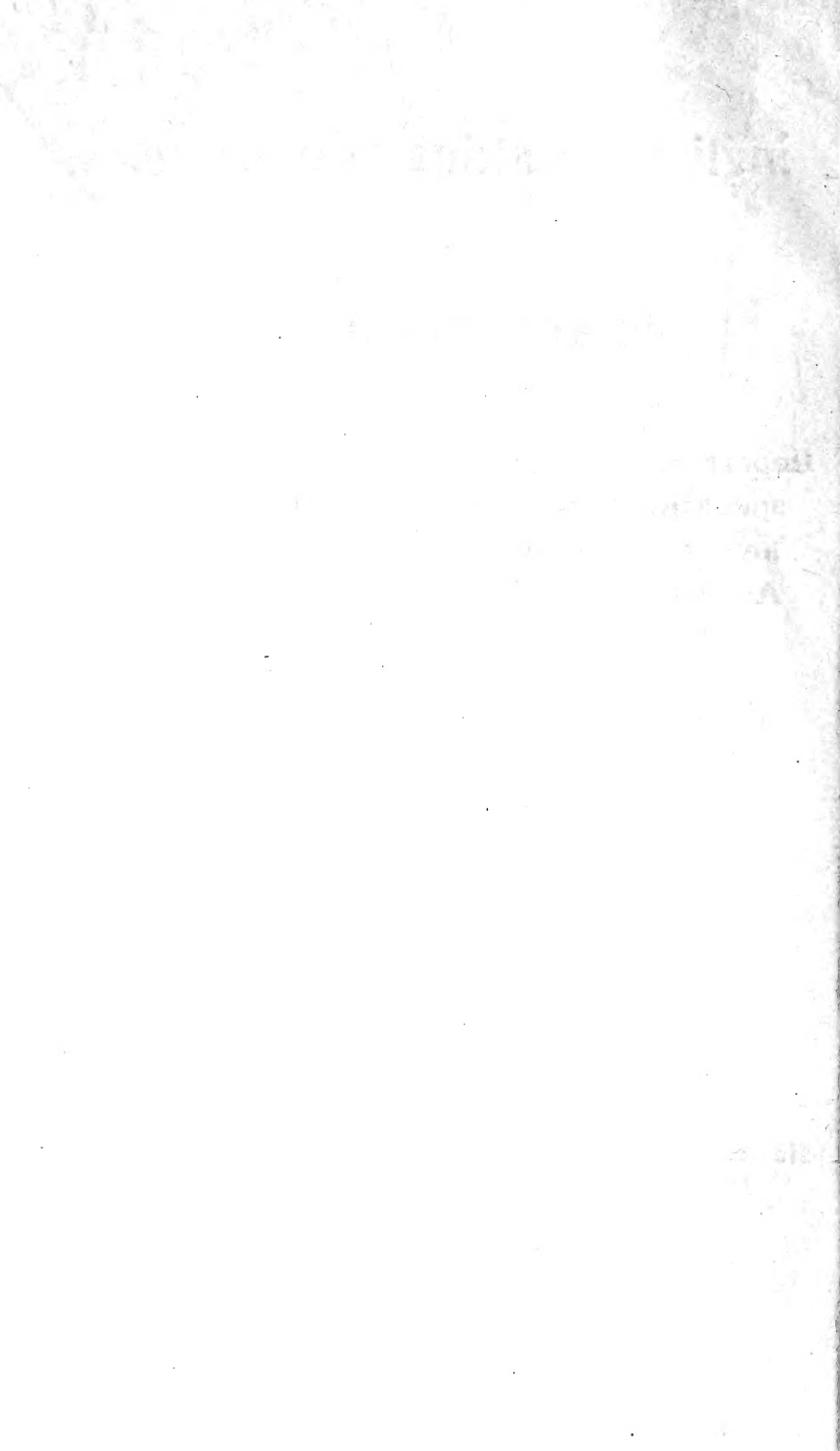
President of the Local Government Board



LONDON

National Association for the Prevention of Infant Mortality and for the Welfare of Infancy #
4, Tavistock Square, W.C.

3) 1913



PREFACE.

IN presenting the report of the English-speaking Conference on Infant Mortality, which was held in the Caxton Hall on August 4 and 5 of this year, it may be well to point out that this Conference, though in series with the two which preceded it in 1906 and 1908, is yet distinct from them in that this year for the first time it was conducted under the auspices of the National Association for the Prevention of Infant Mortality and for the Welfare of Infancy, and not as heretofore by a special and independent committee.

The new Association, which was founded in June, 1912, is an amalgamation of the original Executive Committee on Infant Mortality with representatives from a number of other associations and societies interested in child welfare. With permanent headquarters in London, the Association is in an excellent position for pursuing active propaganda work in the interval between Conferences, and for securing the best possible results from the Conferences themselves. The success which is admitted on all hands to have attended the first efforts of the new Association is of excellent augury for the future. The Association enjoys the patronage of their Majesties the King and Queen, and is fortunate in possessing for its President the Right Hon. John Burns, M.P., and for its Chairman of the Executive Committee Sir Thomas Barlow, the President of the Royal College of Physicians.

This year's Conference was distinguished from those of 1906 and 1908 in embracing representatives from every English-speaking country. Twenty-two English-speaking Governments were officially represented by specially

appointed delegates, and, as will be seen from a perusal of the report, a very great portion of the work of the Conference was contributed by our oversea colleagues. That home interest in its proceedings was not wanting may be judged from the list of our own Public Health Authorities who were represented and by the total number of British delegates, some 500 in all.

Much of the success of the Conference was undoubtedly due to the energetic and whole-hearted co-operation of the American Committee, and for their assistance the Association tenders its best thanks.

If we in England have learned much from such model schemes as those unfolded by Dr. H. J. Gerstenberger, of Cleveland, Ohio, and Dr. Truby King, of New Zealand, we can only hope that our Colonial and foreign friends have been able to carry home with them some useful hints from the accounts of our own experiences, which were laid before the Conference by British delegates. In any event, we must admit that we have all had unexampled opportunities for the exchange of views, both formally during the sessions of the Conference and informally at many pleasant social gatherings.

The scope and far-reaching character of the debates can be estimated from the number and the importance of the resolutions submitted to and ratified by the concluding meeting of the joint sections. These resolutions are set forth in full on pp. 445-450, and delegates to the Conference will be gratified to know that the National Association is working energetically to ensure that they shall bear practical fruit.

The Executive Committee desire to record their thanks to the President of the Local Government Board for his inspiring address, and to Her Grace the Duchess of Marlborough for the delightful entertainment she provided on the evening of the second day of the Conference; and, in conclusion, we would invite the support of delegates for next year's Conference, which is to be national in character, and held at Liverpool.

A. K. CHALMERS,

ERIC PRITCHARD,

November, 1913.

Joint Hon. Secretaries.

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							£	s.	d.
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Liverpool	50	0	0
City of London	25	0	0
Manchester	25	0	0
Birmingham	10	0	0
Convention of Royal Burghs	5	5	0
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St. Marylebone	5	5	0
Sunderland	5	5	0
Huddersfield	5	0	0
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Bristol	3	3	0
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Greenock	1	1	0
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OF THE

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Conference on Infant Mortality at Caxton Hall.

AUGUST 4, 1913.

PRESIDENTIAL ADDRESS BY THE RIGHT HON. JOHN BURNS,
M.P., PRESIDENT OF THE LOCAL GOVERNMENT BOARD.

Mr. BURNS, in opening the Conference, said:—

Ladies and Gentlemen,—This is the fourth Conference on infant mortality held in this country and in this Hall during the last seven years. This Conference has been enlarged during the past two years in its object and in its scope by uniting within its organization a few other associations and movements, by means of which greater unity and solidarity have been given to the national movement as a whole. The Conference from its humble beginnings has become, I am glad to say, a world-wide movement—world-wide in a practical character, because its aims were sensible and attainable—and its methods being practical and sane its achievements have been very great. The present Conference is not confined to Britain, but includes all the English-speaking countries, and as President I welcome to-day the American, the Dominion, and the Colonial representatives. We can learn much from these new communities, some of whom are without the heritage of difficulty that we have endured and now endure. To them we can show many illustrations of good and successful work, and above all, many warnings, and if they do not take heed of them in the early stages of their communal life, it may result in disaster to themselves in the years that are to come. From the English-speaking peoples have originated during the last 100 years the great codes of factory, of public health, of sanitary, of penal, and education laws, and in the Mother Country a new movement was begun some seven or eight years ago. That movement, which is your Conference work,

was to reconcile the health of the people with the growth of trade, and city life with personal strength, and individual happiness—and that in a word is the object that brings us here.

May I say to the Colonial, the Dominion, and the American people how important it is they should really co-operate with us and do more than fraternize in sentiment with this object? Last year 300,000 people left this country for Canada, Australia, New Zealand, or America. Of that number 82 per cent. went to our British Dominions as against 28 per cent. fifteen years ago; and, speaking broadly and roughly, those that leave this country and do not go to British Dominions beyond the Seas find their future life in America. The importance of this movement in our work is shown by this simple fact—the English-speaking peoples have a similarity of life, of language, of aims and ideals. That being so we are all called to the common need and duty of seeing that our stock is good, that our children are clean and healthy, our women strong, and our men enduring. We are pioneers and colonizers probably to a greater extent than any other country in the world. We can truly be said to be the modern Romans, whose strength is in our arms and not in our swords; and, exporting as we do 300,000 of our men, women, and children every year, it is our serious duty to those countries to whom we send them that, so far as we can guarantee, our nursery shall be well equipped with all the essentials necessary for the production of strong and healthy people. Now we are willing—the English-speaking peoples—to unite in agreeing that the source of our strength is in noble motherhood, healthy parentage, and happy, healthy children; and as the stream is no purer than its source, it is our business, having concentrated so much on the child with such beneficial results during the last seven years, to see that we do not lose sight of the mother. (Cheers.) The English, may I say the British, people have led the way in commerce, in industry, and in the growth of representative institutions. Increasingly we must hold our place in the world. I believe that that place cannot be upheld except by the vigour of our men, the health of our women, the strength of our children, and the endurance of the race. Health is more than wealth; physical strength and moral courage must go with organized and individual culture. For this—and this is one of the works of this Congress—for this the parents must be cleanly wed, and the children nobly bred, wisely fed, and firmly led. (Cheers.)

In securing these objects there is an ever-increasing need for specializing on certain aspects of parentage and child

life. As countries become urbanized—and they all are becoming urbanized—communities concentrate; the population gets denser per mile and denser per acre, and unfortunately denser per house; and in every land the countryside is yielding to the town life, with the result that the early years of life in urban communities are denied the quiet, the rest, and the fallow conditions so essential for a happy, healthy childhood. It even goes beyond this; and just as the physical history of all of us, I believe, begins with our grandmothers, so the life of a baby is measured now in city life more by its pre-natal condition than by its post-natal environment. I am glad that the doctors, who have been, I am pleased to say, the backbone of this movement, are increasingly giving their attention to that aspect of the subject. Modern conditions of themselves—quite apart from housing, money, and the means of commanding the mere physical comforts of life—the modern conditions of city life are inimical to childhood. Housing conditions, the atmosphere, the aggregation, the food, the noise, and the stress of city life may be harmful—even education when undertaken too early may not be altogether the wisest thing for the physique. It may be that even where the physique is good certain types of education are not fitted for certain physical characteristics. It is not an accident that clergymen and gardeners have the longest and on the whole the best and worthiest lives. Clergymen and gardeners have an almost perfect condition of life and environment for developing the physical, the moral, and the mental faculties. What we have got to do is not to dispossess the clergyman and the gardener of their good conditions, but to try by every means within our power to approximate the life of every other section of the community to that of which the clergyman and the gardener now have a comparative monopoly.

How can that be done? I do not believe it can be done all at once—anything that can be secured all at once is not worth having; but I want, if I may, to give one or two illustrations. One of the healthiest, as it is one of the prettiest and one of the wealthiest communities I know in the world, is the parish of Hampstead. Hampstead at one end of the scale had an infant mortality of 62 per 1,000 in 1912—very creditable indeed, but given their conditions it ought to be less than 50. Shoreditch, at the other end of the scale in London, had an infant mortality of 123 per 1,000, or just double. Social, economic, and financial conditions are to a great extent responsible for the difference between Hampstead and Shoreditch. But you have not reached a final conclusion when you state the proposition in that way.

I will take other districts. There is Burnley, which had in 1912 an infant mortality of 145 per 1,000, and there is Battersea, a similar community, with an infant death-rate in the same year of 84 per 1,000, or only a little over half that of Burnley. I shall want a lot of convincing to believe that the economic, social, and financial differences between Battersea and Burnley are the reason why Burnley has an infant mortality of 145 per 1,000—considerably less than it was when you began your movement, viz., falling from 212 in 1906, and 171 on the average of the four years 1907-1910, to 145 in 1912—while Battersea has 84 per 1,000. It is due, in my judgment, in part at least, to this fact—that in Burnley too large a percentage of the mothers are at work, while in Battersea the women are at home. I believe that women, now that they are increasingly entering into all phases of commerce and industry and into official and administrative life, must themselves realize that, so far as their offspring is concerned, this tendency, if unchecked and unregulated, is attended with considerable disadvantages to the community and the race as a whole. I must here ask—can poor communities improve their condition so far as their children are concerned? In that connection I speak of what I know most. Fifteen years ago the infant mortality of Battersea was 176 per 1,000. To-day it is 84 per 1,000, or rather less than half what it was fifteen years ago. I do not believe that there has been any improvement in the total wages—speaking generally I should say the working community there is no richer than it was—yet in that period the infant mortality has been just halved. Why has that happened? It has happened because Battersea, being a prescient neighbourhood and a far-seeing district, had the courage to see in advance what this Conference is now seeing is essential for the rest of the community; and having the advantage of a medical officer who showed us how to do our own work better with than without his skilled service, we laymen stood by him loyally; and the result is this extraordinary saving of infant life in a working class district.

Now if I may I will take another example. Lancashire is industrial; its industries are a marvel to everyone. Commercially it is very prosperous, and, broadly speaking, the people have regular work with relatively good wages. No county in the kingdom has a lower pauperism than Lancashire, but it stands highest in the list for infant mortality. It is lower than it was, but still far too high. In some towns, in some parts of its towns, the infant mortality where the mothers go out to work and the children are thereby neglected is three to four times what it is in Hampstead

and Belgravia, and double or treble what it is where women of the same class do not go out to work. I hold strongly the view that for at least four months before the child is born, and longer after the child is born, mothers should be mothers and not machines. (Cheers.) In a Birmingham area—and you have the facts in a paper before you—the infant mortality is 200 per 1,000. Eighty per cent. of the mothers work in factories from the time of leaving school; 60 per cent. continue to work after marriage. Surely on these figures it can be said that where industry flourishes and married women labour there children decay. I hope that this Conference will realize that what is true of Birmingham and of Burnley is true of Preston and many other districts—all of which, however, are infinitely better in this regard than they were seven years ago. I do not say it in any invidious sense—but I think motherhood and the rearing of children and of a happy race of fine boys and girls are the noblest of all callings; we should see that it is not made the meanest of trades.

Why do I put this in this way? Because this can be done. You, Sir Thomas Barlow, worthily represent a great profession. I believe with all its faults yours is still the greatest of all professions—(laughter)—and it is great not only because it does so much for the community which the community cannot do so well for themselves, but because it does so much for its own wives and children. I have been looking into the infant mortality in your profession, and I find that doctors' babies die only at the rate of 40 per 1,000. In the upper and middle classes the rate is 77 per 1,000, among artisans 100 to 130, miners 160, and unskilled labourers 150; among agricultural labourers, notwithstanding their brutally low wages, the infant mortality is only 97 per 1,000. These facts show what the doctor can do by skill, and above all, by persistent attention continuously in small things for his own wife and family. The community is going to ask the doctor to do for everybody what he does so well for himself. You are too generous to keep to yourselves what was meant for mankind.

These facts also show that high wages in themselves are not sufficient, because high wages with drink—and high wages with drink always mean inferior housing—are more fatal to the child than low wages with good air, reasonable housing, and restful surroundings. Man does not live by money alone. The important things are sobriety, care, cleanliness, wise feeding; and not too much feeding, for in certain sections of the community as much ill-health is imposed on children by over and unwise feeding as by

insufficient feeding. My own view is that more wages, unless wisely spent, would be a disadvantage with some people; but nothing delights me in this connection more than to see that, accompanying the high wages of the last ten or fifteen years, there has been wiser spending. All foreigners, Americans, Canadians, and others, who now come to this London in which I live and move and have my being, and of which I am very very proud, marvel that, considering its size, London is so sober. The fact is that in this great city, and everywhere throughout the country, during the last fifteen or twenty years, the higher wages are being attended by a wiser spending, which has been a great factor in the improvement of health.

Now, Sir Thomas, we ought at a Conference like this to think not only of the mothers and the children. After all, the father is the breadwinner, he is the father of the mother's child, and I do think the time has arrived when you worthy ladies and gentlemen who have been concentrating on the child and the mother during the last six or seven years might give a little of your attention to the fathers of the children. Nothing, I think, would be more beneficial to your movement than for a few enterprising young ladies to hold dinner-hour open-air meetings outside the big factory gates, and tell the fathers who ought to be husbands—and to their credit the bulk of them wish to be—that it is their duty as individuals to guarantee proper treatment of their wives so far as they can. Society owes it to the future to see that the mothers and the children should be healthy and strong. The marvel to me is that mothers and children have survived as well as they have considering their environment, and we who are here, consisting as we do of the more comfortable section of society, ought to see to it that the poor are not allowed to suffer through any neglect or ignorance which we can remove.

I put this to you not as sanitarians, doctors, and medical reformers, but as ratepayers. Forty per cent. of our pauperism—and our total pauperism costs over fifteen millions a year—is due to widowhood and orphanhood. One of every three widows who come on the Poor Law comes through the illness of the breadwinner or of some of the family. I am at the present moment the foster-father to 270,000 Poor Law children, many of them very young. That is one side of my interest in this subject. I want my family to diminish rapidly. We are getting them out of the workhouse as quickly as we can turn the healthy young rascals out. I do not want so many foster-children, and if this Conference continues for the next seven years the

splendid work which its devoted labours have achieved in the past, I shall see my family more than halved. I am here to stimulate you, as President of the Local Government Board, looking after this large family. I want you to realize that from 50 to 60 per cent. of our total pauperism is due to illness, sickness, accident, or ill-health, and I say that if your movement had been started 100 years ago this state of things would not exist at this moment to the extent that it does. Some will say, "But, Mr. Burns, have we been justified by what has been attempted?" Well, as it is my business, I have looked at the facts since the time you began your work in this Hall. In the seven years since this Conference first met the general death-rate has diminished 13 per cent., the tuberculosis death-rate 18 per cent., and infant mortality over 30 per cent. It is a great achievement that while, when you launched this Conference, the infant mortality in England and Wales was 145 per thousand, to-day it is 95 per thousand only.

But, better still, take the total saving of life in these seven years. In this period no less than 545,000 human lives have been saved from death, as compared with the previous seven years; and of this number nearly 200,000 have been saved owing to the diminished infantile mortality. We are now saving over 50,000 lives per annum on our infant mortality rate, or nearly the amount of the total emigration from the Mother Country to Australia. So you see that we are reversing the saying; the Old World has been brought in to adjust the balance of the New, and with those snatched from death out of the Old World we are now peopling the waste places of our Dominions. These are a few of the actual achievements of seven years; and how has this been done? It has been done mainly because my Department has pioneered the way. Men like Dr. News-holme, whose valuable report on infant mortality is before you this week, Sir George Newman, and all the other doctors who have identified themselves with this movement, have brought pressure to bear on the State, on Ministers, on Cabinets, and on Municipalities. And how has it been done? Well, you first asked me to bring about the notification of births. Sir Thomas, we have realized from that more than I ever expected in so short a time. Four hundred districts have adopted the Notification of Births Act; twenty-one millions of population are under it, or 56 per cent. of the population of England and Wales. We have also introduced another very important notification, that of ophthalmia of the newly born. The effect of that on the numbers of blind in the future will be very remarkable. Up

to now 234 districts have adopted it with twelve millions of people, or 33 per cent. of the total population of England and Wales. All forms of tuberculosis are notifiable now.

The notification of births, of ophthalmia of the newly born, and of tuberculosis, brings into the household, first the doctor, then many other agencies; and when there the doctor, the matron, the midwife, and the nurse look round, and as a result they concentrate their observation on other things and defects from which the family may be suffering. We have the Children Act in operation; we have medical inspection in all our schools; the Mental Deficiency Bill has passed the Commons; under the Insurance Act the maternity grant is available to 18,000 mothers per week, or nearly 800,000 in the course of the year—and I attach less importance to the mere receipt of the money, important though it is, than to the agencies and the influences that the money attracts and conjures to the bedsides of the expectant mothers. Again in housing, as one instance only, we have been able under the Act of 1909 in the last two years to make 66,000 houses fit for human habitation that were not fit for occupation two years ago. There has been greater sobriety, as I said before, amongst the people; and thanks to the infant consultations, to the 200 voluntary health societies, to the lectures which have been given and literature distributed, far greater care is given now to child life and the pre-natal condition of the child. On this and the care of the mother every municipality, every health committee, and every voluntary association concentrate their attention. We have had—and it is right to say it and I thank you for it—we have had better midwifery. The midwives, who are better educated, do their work in a most devoted, painstaking, and kindly way. We have had the appointment of public health visitors, and we have better education, thanks in no small measure to my Right Honourable friend the President of the Board of Education. The education of girls between 10 and 14 in the elementary schools and in the secondary schools from 14 up to 18 will fit them far more for their future life than the past education fitted their mothers. I have done my best in a number of small ways to help your movement. I have tried to secure clean beds by means of the Rag Flock Act. I hope to introduce this week a Pure Food Bill, and although our Milk Bill has not passed, we have been able through an Order of the Board of Agriculture to devote £120,000 a year, half out of the rates and half out of the taxes, for the slaughter of tuberculous cattle. That, I hope, with the passing of our Milk Bill next year, may do more to accelerate your movement.

But I should not be fair to a Conference like this, above all on a people's Bank Holiday, if I did not tell you what the Insurance Act is doing—whatever its merits or demerits, and time alone will decide that question. I think time is already deciding on the right side. At this moment 500,000 persons are receiving medical benefits at a cost of something like £100,000 per week; 270,000 are receiving sick pay at the rate of £110,000 per week, and as I said before, 18,000 mothers are receiving maternity benefit per week. The fact is, Sir Thomas, the rapid concentration of our people on health matters is the wonder of all the foreigners that I meet, and the marvellous diminution of our death-rates, especially from particular diseases, is to them a subject almost of amazement. Speaking as I do, as one who often walks about the streets in poor districts, I say there is no comparison between the child you now see in the streets of Deptford, of Bermondsey, of Battersea, or Rotherhithe, as regards his clothes, his boots, his cleanliness, his teeth, or his general physique and demeanour, and the children that I saw when I was a boy, and I mention this as an instance of the progress that has been made to stimulate you to greater endeavour. Some will say—is it true that notification has done that, that medical agencies have done this, that the doctor has done his share, and the nurses and the matron have done the rest? No, it is not altogether true, and each should not claim more than their proper share. Never forget this: During the last six or seven years that you have been most active we have had extraordinarily good trade. For instance, the general death-rate has dropped down 13 per cent. in seven years, but your pauperism has dropped 25 per cent. in the same period; whilst your outdoor pauperism has dropped 36 per cent. in the same seven years. That may mean that with higher wages, with less distress, with more employment, accompanied by wiser spending, the people have of their own volition and of their own means been able to do a number of things that some of us are accounting to ourselves for righteousness and to the effect of the particular cause with which we are identified. Well, the fact is, medicine reacts on economics and economics reacts on medicine. My own view of the ideal condition of life is that of the Vicar of Wakefield, whose tastes were simple because his wants were few. But this I do believe, that if bad trade were to come to-morrow (and there are no signs of it I am glad to say), if pauperism were to increase and unemployment to grow, I do not believe that we shall ever go back from the solid achievements that your Conference has secured in the improvement of the health of the mother and the child.

I have only a few more words, Sir Thomas, to add, and they are these. In looking around we are apt to concentrate on the slum, on over-crowding, on drink, on bad feeding, on neglect, but we ought not to forget that the greatest peril to infantile life lies in the peril of birth. It must be so, because in some districts of every 1,000 children born, from 100 to 150 will die within a month, even within a fortnight. That means that as much depends upon the conditions affecting the child *in utero* and at the time of birth as on the conditions after birth. That the perils of birth can be got over by care is evidenced by the way in which doctors save their own children, and by the fact that Hampstead's infant death-rate is half that of Shoreditch, and Battersea's is half that of Burnley. I do believe that until we devise some means by which the working class mothers, especially in the poor districts, shall have some of the care, much of the attention, and nearly all the medical supervision that rich and middle class women have during their pregnancy and at their confinements, much of our work will not be as fruitful as we would desire. How are we to secure that? It is for you in your various sections to determine; but this I can say—public opinion, Parliament, the Cabinet, and all the Ministers are willing to help you if this can possibly be done. How can it be done? I will give you a good illustration. I have been reading the latest Report, and an excellent document it is, of a very worthy doctor, Dr. Hope, of Liverpool. Dr. Hope mentions a district in which the infant mortality was 200 per thousand. In 874 families, he says, there were born 3,801 children, and 1,895 of these died in the first year, or at the rate of 498 per thousand per annum. Now the curious thing about it was that the survivors were very good stock indeed, and I believe Dr. Hope would assure you that, if those who died had got over the particular accident that prematurely terminated their existence, their stock would have been as good. Now we ought not to have such a wicked instance of "love's labour lost." We ought not to have the deaths of so many children born of healthy mothers and of good fathers, especially when doctors say that had they survived and got over the preventible accident that shortened their lives they would have been equally as good as the rest of the family. Well, I do not know if these mothers had too many children; if so, it would have provided an excellent opportunity for some other women who had no children to have adopted these surplus youngsters. I would like to see that almost universally done. There are too many women who are childless, mourning over cats and keeping the

company of dogs, who I think would be much happier with the company of other people's children; and I make this suggestion, that if, instead of wasting guineas on overcoats for lapdogs, and slippers for hounds, and bracelets for favourite puppies—as sometimes you may see—if some of these ladies will come to me I shall be only too pleased to convert myself into a children's agency by means of which I can provide them with substitutes—human substitutes—for their feline and canine pets, and it will do them more good than they think. (Laughter and applause.)

I come now to one other point about the supervision of mothers. I would only say this: If all the poor mothers had the same standard of supervision and care that Poor Law mothers generally get in Poor Law institutions, I am convinced that infant mortality would drop down very rapidly during the next few years.

I have one or two suggestions in conclusion to make to you. Next year I think this Conference ought not to be held in London. This Conference ought to be held where it is most needed, viz., in Lancashire. I suggest either Manchester or Liverpool; and here may I say how much credit the Editor of the *Manchester Guardian* deserves for the manly and courageous way in which he reviewed the report of Dr. Newsholme, and told Lancashire to its face that it ought to be ashamed of the condition which that report reveals? If you will adopt my suggestion, I think you ought to have next year's Conference either in Liverpool or Manchester, and I should be delighted to go to either city and preside over it, unless you can get someone better. There is another thing I wish to say, and it is this: In all the work you do by the State officials, the doctors, the health visitors, the midwives, the nurses, and the voluntary associations, remember this—you cannot supersede the mother. I hope you will not try too much. Do everything you can within your power to instruct her, to educate her, and to persuade her how best to look after herself, and safeguard her offspring, but do not by over-attention paralyse her initiative, her capacity, and her volition to do as a mother what every mother ought to be able to do for herself.

My next point is a difficult and a serious one. Next year the Conference should consider more closely than it has done in this year's papers the diseases of maternity and paternity. We ought really to get at the reason—and the doctors want your help as much as you want the help of the doctors—we ought really to get at the reason why 23 per cent. of the total cancer deaths among women occur in the genital organs. We have got to look very closely

indeed into the sexual diseases; their cause, their effect, their results and consequences upon the race and the future generation—secret diseases as to which society shows a prurient delicacy which is dangerous and must be diminished. I am glad to say that the Local Government Board has a report nearly ready for issue on two or three aspects of sexual diseases that I trust may guide you in your work and in your investigations. I would like this Conference to ask Dr. Mott, Dr. Routh, Dr. Ballantyne, Dr. Kerr, and several other members of the medical profession, whom this Conference could agree upon, to come together and see whether the layman cannot be better instructed how to fight these sexual diseases than he now is. It is an important, a serious, a critical, in some respects a vital case, and I would strongly urge it upon you for your consideration. Now in this regard there is no reason for us to be alarmed, certainly not to be depressed—and I trust on this subject we may keep the theorist and the factious politician out of it altogether. I say this for only one reason that you will all appreciate. You will remember the tremendous agitation that the women of England to their credit carried on in 1884. In 1884, rightly or wrongly—I think rightly—the Contagious Diseases Acts were abolished. What has happened? Since young men and young women were wisely deprived of the false security that the Contagious Diseases Acts pretended to give them but did not secure for them, what has happened? In 1884 95 deaths per million living occurred from venereal diseases; in 1910 that 95 had dropped to 47. In 1884 190 children per 100,000 births died under the age of 1 year from syphilis; in 1910 the 190 had dropped to 116. In 1884 106 per 10,000 candidates for recruitment in the Army were rejected on account of syphilis; in 1870 the number was 158; in 1910 the 106 of 1884 had dropped down to only 16, a result very creditable to the improvement in cleanliness of the civilian population, the reservoir from which our Army and Navy is recruited. In 1884 the Home Army admissions to hospital for venereal disease were 270 per thousand; in 1911 only 60. In 1897 522 per thousand of our Indian Army were admitted to hospital for the same disease; in 1910 the 522 per thousand of fifteen years ago had dropped to 55. In 1911, of 48,000 recruits only 81, or less than 2 per 1,000, were rejected for venereal disease, and in the same year the death-rate of our Home Army from all causes was only 2·5 per 1,000, a record of which all of us—all of you doctors and especially the women—can be proud. (Cheers.)

Now if venereal disease is tested by the decline in the

Army (and it is the best test I know and the only reliable test) we find it is declining more rapidly than any other disease. But that is no reason why it should not decline quicker, because I believe that out of the 25,000 blind people that we have in this country from 30 to 50 per cent. of them are blind because of infection from particular venereal disease; and if this disease had been grappled with years ago, as thanks to notification it can now be grappled with in the first week of life, we would not have half the blind people that we have in this country at the present time. I urge you to grapple with this matter seriously, and above all sanely. I ask you not to be stampeded either by cranks or theorists, and above all I ask you to deal with this problem from the medical, the material, the paternal, and the human side, irrespective of any theories you may have either for or against restriction or supervision. My last word to you is this. Some will say, is the lower infant mortality which you now record, as compared with that of seven or ten years ago, good for the survivors? I am convinced that it is. (Cheers.) I am solidly convinced that the lives saved by the lower death-rates mean healthier lives for the survivors generally. I believe that a lower death-rate for infants means a lower damage rate for youths, for boys and girls, and stronger lives and longer lives for all of us. I do not belong to the "better dead" school—that is my description of it—the school who imply that the more per thousand die in infancy the better the survivors are. I cannot see either the wisdom of the argument or the reason in such a proposition. Improved conditions that save the life of the child help the mother, especially after the first child has been born. I do not believe in "health by ordeal"—that, for instance, the health of 300 surviving children out of every 1,000 is stronger because 700 per 1,000 children go to what in my judgment is a premature and unnecessary grave. I believe that contention is absurd and ridiculous. On the contrary, I believe that the lower death-rate of the doctors' children is the best refutation of health by ordeal. I believe that the lower death-rate of the upper and middle classes as compared with that of the artisan and labourer classes refutes that idea, and I am glad that the "better dead" school has not captured this Conference in any of its aspects.

In conclusion, may I thank the American, the Australian, the New Zealand, the Canadian, and the other delegates for their presence here to-day? May I also thank the devoted men and women who without fee or reward but with the dutiful pleasure only of inspiring others in this good work

have come here—may I say how much we thank you for your services in the past seven years? I would urge you not to be too sectional in your outlook, and above all, I would advise you not to be too bureaucratic in your organization. We want to temper the skill of the doctors with the human kindly common sense of the layman; and where the humanities of the average man and woman are apt to run riot, as sometimes happens with sentimentalists, we want the cold scientific hand to restrain them when they are going too far. I can only say that this Conference—and I have the right to say it—that this Conference owes as much to the medical officers of health, to the midwives, to the matrons, to the nurses, to the schoolmasters and mistresses and the various municipalities of the United Kingdom, as the working classes owe to you for all your beneficent labours. I can assure you that my Right Honourable friend the President of the Board of Education, myself, and the Prime Minister, who at this moment is opening a Conference on Tuberculosis—I can assure you that we hold the view strongly, and we intend to act on it, that the health of the people is the supreme law, and that however much we may grow in trade, in commerce, and in wealth, however much our armies and our navies may increase, however much our material supremacy in the world may grow—all these things are as nothing unless we have clean and happy houses that shall be homes, unless we have homes in which mothers can live decent lives during their hour of trial and difficulty, and unless we have both town and countryside peopled with strong men and women able to endure much hardship, doing useful work for wages to which they are worthily entitled. It is only in this way we can make the English people what they ought to be—the strongest, the healthiest, the bravest, and the most enduring of the peoples of the world. (Cheers.)

Sir THOMAS BARLOW, Bart., K.C.V.O. (President of the Royal College of Physicians), then took the chair, which had been vacated by the President of the Local Government Board.

Assistant Surgeon-General J. W. KERR (of the United States Public Health Service) said: Mr. Chairman, ladies and gentlemen, on behalf of the American Government and the National Association for the Study and Prevention of Tuberculosis in America, it is my privilege to extend greetings to the members and delegates of this English-speaking Conference. The assembling of such a Conference is a cause for congratulation. It is an indication of a desire for the extension of the safeguarding of human life and the

extension of the ideals of the English-speaking peoples throughout Europe. In America we have been engaged in the solution of economic problems; social and spiritual problems have also received attention to an increasing degree. One of these has been the protection of infant life. It is a great work, and, as has been our custom, we turn to older countries which have had experience in the handling of such problems. We in America are already indebted to this country, whose guests we are, for precedents in respect to organized government and public health administration. I trust that as a result of this Conference we shall obtain new ideas, and that we shall go back and be able to put them into effect. I trust that the objects of this Conference will be accomplished and that our stay together will be profitable and pleasant.

Surgeon-General Sir CHARLES P. LUKIS (Director-General of the Indian Medical Service): Allow me on behalf of my fellow delegates from the Government of India to say what great pleasure it gives us to have an opportunity of being present at this very important Conference. Of recent years the subject of infant mortality has engaged the serious attention of the Government of India, but no one unacquainted with life in that country can have any idea of the difficulties which there beset the path of the sanitary reformer. The illiteracy of the majority of the population—90 per cent. of whom live a life of fatalism—their innate dislike to any innovation, their ignorance and their disregard of even the most elementary rules of domestic hygiene, all combine to build up an almost insurmountable barrier in the path of rapid progress in sanitary reform. The Government of India recognize these difficulties and have, on my advice, sent three delegates to this Conference—myself to study the administrative aspects of the case; Colonel Green, Professor of Midwifery at the Calcutta Medical College, with the point of view of a gynæcologist; and Major F. H. G. Hutchinson, Deputy Sanitary Commissioner at Poonah, to study hygienic and sanitary problems. You will see that the Government of India has taken a great interest in this movement, and if we do not take any large part in your discussions I hope you will realize that this is not from want of interest, it is merely from the fact that we come here to obtain information rather than to impart it.

The CHAIRMAN: I am sure that we shall give our warmest sympathy to our brethren in India in the gigantic task that is before them.

Dr. CHARLES A. HODGETTS (Medical Adviser to the

Canadian Commission of Conservation): Sir Thomas Barlow, ladies and gentlemen, on behalf of the Commission of Conservation, including the people of Canada generally, I have to extend their most cordial thanks for the invitation extended to us in Canada to attend this Conference on Infant Mortality, and their greetings as one of the parts of this great Empire. We in Canada have difficulties quite different from those just described. We are taking, as the Right Honourable speaker said this morning, some 82 per cent. of the emigration from this country, and as these people come out to Canada they bring with them many of the thoughts and many of the mistakes which exist in this country and it is extremely hard for us to meet these difficulties. However, irrespective of politics, the members of all the Governments are interested in public health. The Commission of Conservation, of which I am Adviser, has been deputed to consider what is best for the conservation of the interests of our Dominion, and the Chairman of that Commission has stated that he considers that the health of the people is of first importance, not only for Canada, but also for the Empire. It is our interest not only to consider the infant, but also the mother and the father. We only trust that whatever resolutions are passed here and whatever decisions are arrived at, we may carry back to Canada good words of counsel and advice which Canada will follow closely.

Dr. W. PERRIN NORRIS (Chief Medical Officer of the Australian Commonwealth Medical Bureau): Mr. President, on behalf of my colleague, Dr. Mary Booth, and myself, I desire to express our keen appreciation of the privilege of membership in this Conference and to convey to you greetings from the Commonwealth of Australia and from the organizations there concerned in the subject with which the Conference is to deal. Twenty years hence, when the spade-work of the new practical science of eugenics will have been done and the harvest is ripening, we may have to consider the problem of infant mortality from other standpoints, but to-day we are called upon to seek by every means in our power to staunch this wound in the nation's side and to save all those infant lives not irrevocably doomed or hopelessly blighted from birth. Surely what has already been accomplished here and elsewhere is full of encouragement and promise for the future. Wherever there has been properly organized effort the infant mortality has steadily fallen, and in Australia, as in Norway and still more in New Zealand, we have been able to keep the death-rate far below 100, the rate which till recently was our aim.

Indeed, our infant death-rate is now nearer 50. In view of what has already been done and what remains to be done by the deliberate application of scientific research to social problems we may look for a material increase in the only true wealth of nations, namely, healthy, joyous, human life, and at the same time for the remedying of those economic and environmental conditions which now hinder human well-being and happiness. I would ask whether, inspired by this hope, the Conference might not see its way to express its opinion that there is no reason why in every effectively organized nation the infant mortality rate at the present day should not be reduced to 50. What a gain this would represent, not only in lives saved, but also in the reduction of the terrible mass of human sorrow and pain embodied in the empty arms and aching breasts of mothers bereft and whose suffering has been fruitless. From the agenda it is plain that this Conference means business, and if we at the outposts of the Empire are wise, the gains will not be confined to Great Britain. We in Australia also are in need of such knowledge as the Conference will impart, and we hope and believe that its deliberations will be fraught with fertile good for the helpless, unenfranchised infants and the mothers who bravely bear them throughout the English-speaking world.

Dr. F. TRUBY KING (New Zealand): Mr. President, ladies and gentlemen, I am here to convey from the Government of New Zealand and from the Society for the Health of Women and Children of New Zealand greetings to the Conference, and on my own behalf I can only express my feeling of great personal obligation in the privilege I have of being present at this meeting this morning. I may say I was sent here from the other side of the world solely for the purpose of attending this Conference and for gaining information which will be of value to the women and children of New Zealand. It was somewhat depressing, perhaps, on arriving, to be told by a candid but somewhat pessimistic friend that little value was attached to the work of congresses, that there were too many of them and that they arrived at no practical result. I can only say that the admirable address we have had this morning and the speeches which have followed on the President's address are of the happiest augury. But, after all, we do not need to go upon expectation. We know what has occurred from congresses of this kind in the past. Take, for instance, the Tuberculosis Exhibition which was held in London four years ago. The President

of this meeting at that time made one of his cogent speeches, and that was reproduced throughout the world, and the benefit of it was reaped by the most remote portions of the Empire. For instance, in New Zealand I can say this (I can only speak for the country which I represent), that the Society for the Health of Women and Children disseminated a quarter of a million copies of the speech which was made at that Congress; and I cannot conceive that such information directed towards the betterment of man could fail to be of the greatest general benefit. As a matter of fact, I know that it is so. I am sent here, not for the purpose of conveying information, but for the purpose of acquiring knowledge which will be a benefit to us, and I have no doubt that we shall have plenty of fruit to carry away; but much more will come from reading the addresses which are to be given. With regard to what the last speaker said as to securing some direct pronouncement on the part of this great Congress as to what would be a reasonable figure for an infant mortality rate, I am heartily in accord with the suggestion that anything over 50 per cent. in the not distant future should be regarded as abnormal. I am optimistic enough to believe that our rate will be reduced to half that figure, because, even under the most favourable conditions, the death-rate in infants is due largely to avoidable causes. In the lowest rates I have seen the figures are not as low as they might be, for included in many of them have been deaths due to such causes as over-laying. I think it would be a very great benefit if some kind of pronouncement were made by this Conference in that respect. There is just one other point I would like to refer to. I think that, considering that this is the centre of your vast Empire to which we are looking for inspiration, it would be a very great and very noble thing if this Congress and the agencies which it can command would give some more definite pronouncement than now exists regarding certain cardinal points dealing with the health of children. For instance, I should like to see as definite a pronouncement as possible made with regard to the frequency with which children should be fed, because the practice varies so largely between ten times in the twenty-four hours to five times. There are also other matters—such, for instance, as whether the child should ever be fed during the night. We have the means at our disposal, and anything coming from the centre of this great Empire would have an enormous influence upon us at its periphery. I have to thank you for your patient hearing and to convey greetings on behalf of New Zealand.

Alderman BENJAMIN BROADBENT: Mr. President, as a member of the Committee of this Conference and on behalf of the honorary foreign members, it has been enjoined upon me to convey to this Conference of English-speaking peoples the good wishes and the appreciations of the various nationalities they represent. Although this is purely an English-speaking Congress, it has attracted the sympathies of other countries; in fact, those who are interested in this movement, whatever their country, cannot keep away from such a Conference as this, and we have present representatives from Russia, Germany, France, Belgium, and other countries, and it is on their behalf that I beg to present my greetings and congratulations.

This concluded the formal opening of the Conference.

ADMINISTRATIVE SECTION.

FIRST SESSION, AUGUST 4.

CHAIRMAN: ARTHUR NEWSHOLME, ESQ., C.B., M.D.,
D.P.H., MEDICAL OFFICER TO THE LOCAL GOVERNMENT
BOARD, ENGLAND.

The CHAIRMAN: Ladies and Gentlemen, I think we are now ready for our sectional business. This is the Administrative Section, and we have before us a very important and an admirable programme, including a large number of papers on "The Responsibility of Central and Local Authorities in the matter of Infant and Child Hygiene." All these papers deal with direct infant and child welfare work, as distinguished from the indirect work of sanitation. This direct work with regard to child welfare, as I have stated in the report that has been alluded to already, consists principally of four divisions. First you have the ante-natal aspect, which, happily, is coming more and more to the front, and under that heading we have to consider means for the prevention of the disease of syphilis, which is one of the most important causes of infant mortality. In the second place comes in the care of the midwife, and however good and important the work of the midwives is at the present time, everyone will agree that there is very much scope for improvement. Then if the work of these midwives is to be well done, and that of the monthly nurses working with them, it is quite clear that most important work and advice to the mother during the first week or ten

days of the child's life will have been done under right assistance. Then comes in the health visitor, who supplements the advice already given by the midwife, who carries on the counsel and teaching to the mother throughout the whole of the first year of the infant's life. In connection with this we cannot lay too much importance upon the advisability of increasing the number of those infant consultations which are, happily, becoming established all over the country in our big centres of population, for however well trained the health visitors may be, there is a certain amount of medical work in connection with the care of infancy and the protection of infancy that can only be properly done at such consultations or by medical men or women. Then the last aspect of direct child welfare work with which we are concerned is to remember that it is not confined to the first year of life, but that it goes right up to the period of school life, and we have to consider measures for stopping the gap between infancy and school life, filling up that gap by continued child consultations and other means which will enable us to treat at the earliest possible stage, and as far as practicable prevent, the diseases which are found to such an enormous extent, when the valuable system of school medical inspection comes into operation. Those, roughly speaking, are the branches of child welfare work with which we are concerned. They are of extreme importance, and their importance is becoming realized to a greater extent by local authorities all over the kingdom. I wish to say one word about the pre-conditions which are necessary for the success of this work of child welfare. It is necessary in order that child welfare work may be successful that every child shall have in its home the elementary conditions of a sanitary life. When you remember the fact that, taking four average years of recent date, we have differences such as between Stalybridge, with an infant mortality of 149, down to others in which the mortality nearly reaches the figure of 50 per 1,000, which has been mentioned already by one speaker as approximating to the ideal, you will see that there is much to be done. Those differences are not due to the fact that in the towns with the highest mortality there is a total absence of child welfare work, but owing to the fact that the conditions of a decent sanitary life are not present in those towns or in some part of those towns, and speaking as I do this morning to representatives of sanitary authorities from various parts of the country, I wish to say a preliminary word to impress upon you the importance, whilst doing all the direct child welfare work which lies before you, of not neglecting the duties of

elementary sanitation which are not being practised in every part of every town in this country. That they are not so being practised is shown not only by the excessive mortality in certain towns, but by the excessive mortality in certain wards of towns, and these differences in infant mortality are found to correspond with the sanitary arrangements. You find with a high infant mortality you have scavenging arrangements which are very bad; you find unpaved yards instead of proper paving; ashpits instead of movable dustbins, and you have, above all, privies and many other abominable sanitary arrangements instead of a water carriage system. Until every house in every town in this country has those conditions removed and replaced with more sanitary arrangements; until every housewife has a water-supply in the house and has access to ordinary sanitary conveniences without having to go down three flights of stairs, it cannot be said that we have made the conditions possible which ensure the success of child welfare work. That is the message which I want to give to you this morning—that while recognizing the importance of direct child welfare work (and its importance is realized by no one more than myself), we should not forget that, in order to make this direct work a success, it is indispensable we should provide the elementary conditions of sanitary life for every family in every town in this country. (Applause.)

THE RESPONSIBILITIES OF THE CENTRAL AUTHORITIES.

By F. E. FREMANTLE, F.R.C.S., F.R.C.P.

County Medical Officer of Health for Hertfordshire.

At 5 years of age the State draws the child out of his home into school. Till then he is under parental control. In what way should the State control or supplement the parental care?

That there should be some such control is agreed. The State has a right to preserve and strengthen infant life in its own interests; it has assumed a duty to protect the individual infant even in its own home. But State action does not begin at the infant's birth. It is now agreed that the community has a right, and, if so, a duty, to prevent some of the worst misfortunes

of procreation. The Mental Deficiency Bill goes to the root of infant mortality, and is urgently required.

Towards the infant at and after birth the State has accepted certain duties¹: (a) To secure the rights of children against violation by their parents; (b) by advice or otherwise to help parents in the fulfilment of their parental task; (c) to provide a substitute for the parents in case of their default through death or incapacity. These objects are to a large extent obtained by the State through purely legal and non-medical measures. If, in this Conference, we refrain from discussing the general laws of marriage, of property, of guardianship, of cruelty and crime, we must at any rate express our sense of the important part played by such laws in fixing the physical character of the infant multitude, and reducing its mortality.

Historical.—English law has always held the father civilly liable to his children for wrongs done to them; and the Court of Chancery, on behalf of the sovereign as *parens patriæ*, has always assumed the right to assume or transfer the wardship, where parental rights were abused. The conception of this abuse has been enlarged in recent years, parental duties being thus very greatly increased, while filial obligations have diminished. This is of some significance in connection with the falling birth-rate; for to the nation, as Sir J. Compton Rickett has said, babies are getting scarcer, and by the law of supply and demand are rising in value, while to the parent children are certainly not the "business proposition" they once were.

Abandonment or exposure of infants was made punishable in 1861 by the Offences against the Person Act; and in 1868 the Poor Law Amendment Act

¹ "The Children of the Nation," by the Rt. Hon. Sir John E. Gorst. Dedicated to the Labour Members of the House of Commons. Methuen and Co., 1906. 7s. 6d.

prescribed summary punishment for wilful neglect to provide children with adequate food, lodging, clothing or medical aid. The chief progress made by the State in the protection of children lay in the institution of effective police; but definite Acts for the prevention of cruelty to children and the protection of infant life were passed in 1889, 1894, 1897, 1904 and 1908. Children are now entitled to protection from injury, suffering or even uncleanness; legal facilities for conviction are greatly enhanced, and the parent, where unable to do so himself, is bound to invoke the aid of the Poor Law. In the administration of these measures the State has been much assisted since 1895 by the Society for the Prevention of Cruelty to Children, and at all times by religious and philanthropic agencies. In discussing the problem of infant mortality sight must not be lost of these disciplinary methods, by which the State throws on the parent his proper responsibility, and provides an effective substitute in the case of parental disability or default. The part played, moreover, by voluntary assistance in protecting infancy against cruelty and neglect is typical of the best method of State action through the co-operation of voluntary endeavour, the powers of the State being held in reserve to be used only where no other power is of avail.

But until medical science was associated with the administration of the law for children, the waste of infant life continued without check. Indeed, even medical science, up to the end of the last century, was astray. We turn to the late Sir John Simon's "English Sanitary Institutions,"¹ a classic, and the only classic on the subject, by the first central medical officer of the State in this country, who served the General Board of Health from 1855 to 1858 and, on

¹ "English Sanitary Institutions," by Sir John Simon, K.C.B. Smith, Elder and Co. Second Edition, 1897.

the demise of that Board, the Privy Council till his retirement in 1876. And yet we look through his book in vain for any recognition of the general problem of infant mortality, and to the end of the nineteenth century a mortality of over 150 was considered normal.

We may turn again to the work of a barrister, the late Sir Edwin Chadwick,¹ the prophet and pioneer of English sanitation, who from his first published essay in 1828 on Life Assurance, to his death in 1890, inquired in turn into every form of preventable death that occurred to his observant and enlightened mind. But neither in his writings nor in the fascinating letters written him by Mill or Carlyle or any of the great politicians or doctors of his time, is any special allusion made to the preventable mortality of infancy.

Public health was mainly a question of epidemic "fevers," and the causes of fever were sought in the external surroundings of human life. The system of public health administration confined its attention to nuisances, sewage disposal, housing, and the isolation of a few epidemic diseases almost exclusively to the closing years of the nineteenth century. It was only then that the growth of physiological and bacteriological knowledge revealed the importance of individual care and habit; it was only then that the declining birth-rate came to be known and that the Education Acts, the spread of nursing, the publication of the reports of medical officers of health, the findings of Government inquiries, impressed on those concerned the possibility, the national advantage, and the imperative duty of reducing the rate of infant mortality. In 1902 the Midwives Act was passed;

¹ "The Health of Nations," a Review of the Works of Edwin Chadwick, by (Sir) B. W. Richardson. In 2 vols. Longmans, Green and Co., 1887.

in 1906 and 1908 the President of the Local Government Board presided over National Conferences on Infant Mortality; in 1907 Lord Robert Cecil's Bill for the Notification of Births became law; in 1908 there followed the Children Act; and an immensity of voluntary and official effort, both local and national, in our own and other English-speaking countries, has already effected an astonishing reduction of the rate of infant mortality. In this country the rate has been reduced in fifteen years from 150 to 95. Every year 50,000 infants are saved that would have died fifteen years ago.

In this campaign the action of the State has been suggested in the inspiring addresses of our President at our National Conferences of 1906 and 1908.

Apart from parental sobriety and other matters, mainly questions for the individual, he dwelt on the influence of medical inspection of school children; on school feeding in certain areas; on the Children Bill; on the purity of children's food; on milk depôts, and on that Milk Bill which he hoped to pass in 1908, but which, alas, has not been passed yet. For the health of the mothers he referred to the prohibition of night work for women, to the Laundries Act, to the Notification of Births Act, and to the Health Visitors Bill. He advised us to concentrate on the mother. We have done so, and a salvage of 50,000 infants every year is the result.

Importance of Inquiry.—Perhaps most important of all has been the inquiry, inaugurated by his department, into the causes and distribution of infant mortality. The first-fruits of this inquiry were given to the world in Dr. Newsholme's report on infant and child mortality in 1910; a second report has just been issued.¹ May I suggest as a subject for

¹ "Second Annual Report on Infant and Child Mortality in England and Wales." (Cd. 6909.) Wyman and Sons.

such future inquiry, the comparison of the infant mortality rates from all and from various causes in those rural areas well supplied—for in rural areas social problems are more distinct—and those not well supplied with district nurses? The result would, I believe, show a very close relationship between nursing and infant health, which would be of great practical value. But to be of value the inquiry must cover a very large area, and must therefore be undertaken by the central department of the State. It is to be hoped, therefore, that this inquiry will be continued in detail and the results presented and retailed in various forms by leaflets, lectures, and cinematograph, as well as in book form, suitable to the intelligence of ignorant mothers as well as of students, public men, and philanthropists.

Ignorance and Voluntary Effort.—The report of 1910 brought out one striking factor which had been gradually revealed by medical officers of health, viz., the relationship between infant mortality and ignorance. Here, then, is one of the most important spheres of action of the State, to secure the instruction of mothers in the feeding and care of infants :—

(1) Through leaflets and health visitors directly appointed by sanitary authorities ;

(2) Through the invaluable schools for mothers, mothercraft clubs and babies' welcomes, which are mainly the result of private enterprise ;

(3) Through the recognition by every midwife, that her responsibility extends over the whole period of infancy ;

(4) Through the visits of district nurses to housewives in their homes ;

(5) Through direct State assistance in the training of district nurses on a preventive basis, every county being permitted and encouraged to have its own training home as a technical school maintained by the education authority in co-operation with the health authorities ;

(6) Through the National Insurance Act and the National Health Week, having in mind (a) the power of Insurance Committees and Approved Societies to contribute to nursing associations, and to disseminate information; (b) the remarkable experience of the Metropolitan Life Insurance Company of New York, who have found it financially worth while to provide nursing to their beneficiaries throughout the United States; and (c) the generous contributions of the industrial life assurance companies in this country to the expenses of the National Health Week;

(7) Through the instruction of the future parents of the nation in the public elementary schools, by courses on home-making and motherhood in those continuation schools that should before long become compulsory on every child up to the age of 16. In these classes due importance must be attached to the fundamental factors of character, morality and religion;

(8) Through the issuing to the public of the annual reports of all medical officers, either at cost price or less, a notice to that effect on the outside of the report being made compulsory, so as to give to the ratepayers the facts and conclusions, at present too often hidden from them.

Specific Tasks for the Public Health Service.—Compared with the value of parental instruction and encouragement, all else is in the third flight. In regard to *milk*, the recent order of the Board of Agriculture, if properly carried out, is likely to have a far-reaching effect; but the Milk Bill should be no longer delayed. The *tuberculosis* scheme is on its trial. The *housing* problem, while much advanced by the 1909 Act, is waiting for its solution until the expense of building new houses is, to some extent, shouldered by the State. The rates and taxes must share the increased cost of rehousing the tenants of houses that

need to be closed. So also must the State promote town-planning, the prevention of future slums, and the revival and development of village industrial life on the principles of the Garden City movement, devising means to prevent the financial interests of municipalities from suffering by the removal of industries to the country.

Wages.—Yet again attention must be called to the part played in infant mortality by poverty. Infant mortality is very largely a question of wages amongst the very poor and half-employed, and in this Conference we must not burke the fact. These are the persons who indirectly suffer from every movement, in these competitive days, for the advance of wages or social reform. The more perfect become international communications and the more serious the industrial competition, the more impossible must it become to maintain both a system of free imports and a higher standard of public health. One or other must go.

The State and Voluntary Agencies.—In matters of infant mortality the State gains much by working through voluntary agencies, which not only provide assistance but also form an unpaid corps of advisers, to persuade the ignorant public how to avail themselves of the assistance provided. These agencies should be linked to the State Authorities, both locally and centrally. The new Central Health (Advisory) Committee for London is a pioneer; a Registrar of such agencies would add much to their efficiency, and by degrees the State, both centrally and locally, may with advantage contribute to their funds in proportion to moneys voluntarily subscribed.

Medical and Nursing Attendance.—The provision of nurses and midwives should be pressed on through such agencies. A County Nursing Association should be established in every county, and should be the sole medium for generous contributions from the County

and County Borough Councils and Insurance Committees. By thus enabling the County Authority to combine its contributions for nursing in connection with schools, tuberculosis and infancy with the private provision for sick nursing and midwifery, the State should before long have provided a complete home-nursing service for the country, with provision for its gradual improvement in training and efficiency.

Medical attendance must also be provided as soon as possible for the children of all insured persons. For this purpose the machinery of the Insurance Act is already available ; but the time is surely come to advocate an advance also in institutional treatment. The Poor Law infirmaries, with their considerable field of medical and surgical practice, should be removed from the pauper system and made the nucleus of a single municipal hospital to be compulsorily provided for every medical and surgical purpose—sanatorium and fever hospital excepted—in every town. Here could be concentrated with great advantage to finance and efficiency the school clinics, the tuberculosis dispensaries and the babies' welcomes, with quarters for the district nursing staff and with private rooms for surgical operations or private patients. The municipal hospital, with its laboratory, library and committee rooms, would form a professional centre for the doctors and nurses of the whole district. But for this purpose it must be in the hands of an authority large enough to ensure a satisfactory service for the medical and nursing staff. What shall this authority be ?

Consolidation of the Public Health Service.—It is now time for the State to gather together the various agencies concerned with public health administration into one systematic army, with due regard to the value of local initiative and responsibility. The central department cannot properly undertake the detailed supervision of the thousands of local bodies concerned, any more than a commander-in-chief can

personally command every battalion in his army. Here in England and Wales the County Councils at present, in the matter of health, are independent of the central department, and have no responsibility for supervising the sanitary work of the districts. Directly elected by the ratepayers, they should be given the control of the district councils, and should be held responsible to the central department.

Then, again, expert services, at present appointed and ordered by local authorities, as in the Navy and Army they were originally appointed and ordered by each ship or regiment, should belong to a single national service, although nominated and posted by recommendation of the local authorities. The municipal hospitals here proposed would be part of the same consolidated service, under management of the local authority, subject to the rules of the service and the supervision of the County Council, the brigadier of local government.

Of this service the central department would be a more complete ministry of health than at present ; it would include the administration of the Factories and Workshops Act, Part I of the Insurance Act, the Medical Act and the Midwives Act, now under other Government departments ; it should be relieved of roads, and of the procedure and finance of Local Government, apart from that concerned with health ; it would give up its mythical Board ; and whether it assumed the correct title of the Ministry of Health or not is a matter of small importance. To this single service would be given the administration of vaccination and of all strictly medical institutions and organizations ; for it is in the interest of the State that medicine should be administered on preventive principles. The curriculum and examinations for the medical profession could then be vastly improved so as to make every doctor in general and Poor Law practice of value to the State as a direct agent not

only for the cure but also for the prevention of infantile diseases. Similar safeguards should be introduced into any system that may come into law for the training and examination of qualified nurses.

The whole subject of the organization of the Public Health service of the country is sufficiently large and important to require the appointment of a Departmental Committee or a Royal Commission; and we may perhaps express a hope that our President may be able to secure the appointment of such a body, so as to crown the work of his seven years' tenure of office and himself become in title as well as in deed the first Minister of Health of the United Kingdom.

THE HEALTH AUTHORITIES WORK IN THE HOME.

BY CHAS. A. HODGETTS, M.D., D.P.H., L.R.C.P.LOND.

Medical Adviser, Commission of Conservation of Canada, Ottawa.

IN the gradual evolution of hygiene as a science there has followed from time to time the assumption by the State of the control, if not the actual solution, of many problems which from their initiation had been operated by voluntary social workers. And local boards of health are now, in many instances, systematically doing, through qualified officials, work that was formerly carried on at the expense of philanthropy. Wherever this is now the case, it can be claimed in Canada at least that the results have been highly satisfactory.

Perhaps the most striking example has been in the anti-tuberculosis work, where the philanthropist was moved to activity and carried on work in different places long before the Government or municipal authorities even manifested interest. Gradually, however, both federal, provincial and municipal authorities have become linked up, and it is quite apparent that

this hitherto sociological movement will become as much a part of routine health work as the care of communicable diseases, the prevention of nuisances, and the inspection of plumbing. The results already attained, where the work has been carried on as a function of the local health authorities, have demonstrated that the efforts of philanthropy have not been thwarted, or checked, but, through co-operation with an authority vested with powers of action, they have accomplished much that was not formerly possible. This is evidenced in better home environment and hygienic methods of living amongst those coming within the sphere of the work.

It is regrettable that in things sanitary our Governments are not always wise enough to profit by the mistakes of other countries. If the pioneer days are over in agriculture it is not so in the matter of "the homes and the babies," for, in many respects, we are following along lines which in older countries have led to death and physical impairment. As regards housing, we can show conditions which would not be permitted anywhere in the British Isles. Whatever good is being accomplished and whatever public opinion has been aroused, is due chiefly to philanthropic workers. With us the evolution is gradual, for, in the rush to get rich, but few of those sailing on the tide of prosperity care little, and heed less, the wail of the suffering infants. What are a few thousand Canadian babies compared to thousands of good, lusty foreigners who will dig and delve while we make the money? In all seriousness I say it, there are slaves to-day who work harder and live in less sanitary environment than did the coloured slave; and there are white babies in Canada who, through no fault of their own, have less chance to survive the perils of home environment than they would if born in other climes. This is due, mainly, because health authorities have not been empowered to carry on their work inside the home.

If one may judge from the amount of money spent, it would appear that the Federal Government has shown, up to the present time, a greater appreciation of agriculture, immigration and the maintenance of a militia than it has of the care of its people. Canada has spent since Confederation some 80 million dollars for militia and defence, 16 million for immigration, and 15 million for agriculture, while not a dollar has been directly spent along lines having for their object the saving of the lives of our infant population. It is argued by some politicians that this is a question solely within the jurisdiction of the several provinces, but that which concerns our most valuable asset is, and must be, worthy of some national effort, particularly when that same Government has assumed the duty of the provinces in the oversight of live stock. The method adopted, as well as the money spent, for this work has been good for the farmer's hog and the pig pen, but surely the infant is worth more and is more worthy of consideration and protection. The ennobling of Canadian motherhood, the fostering of parentalism, spells greater wealth to the young country and to the nation than many of the gew-gaws with which the politicians hypnotize the people.

Few, if any, realize the great possibilities which lie before the sanitarian in the home, which field of work is as yet almost untouched. The hidden wealth contained within the cubical contents of what, under modern housing conditions, we are pleased to designate "a home," cannot be over-estimated, especially when we consider all that "a healthy home" means to a nation.

The subject is presented for the purpose of directing the attention of governments and municipalities to the inestimable benefits which will accrue if they will avail themselves of the opportunity afforded by health departments to prevent the present unnecessary waste in infant and child life. In the marked activity found

on every hand amongst social workers, the fact is apt to be overlooked that their work, in the main, is really a function that should be discharged by health authorities. The maintenance of health conditions as they relate to the individual and his general environment are recognized parts of health work. The widespread activities of philanthropy in all that relates to the child are sufficient to indicate the need for some systematic work being undertaken by State and municipal health authorities.

As this paper is necessarily short, only one phase of this work will be considered here, viz., the baby and the home.

The Baby and the Home.—The baby potentially represents the wealth of the nation. Approximately 35,000 infants under five years of age die in Canada annually, of which number 25,000 are babies who have not reached their first year. This national loss is due (a) mainly to ignorance, (b) largely to environment, (c) partially to penury, (d) occasionally to criminal neglect. The work at present is in the main philanthropic. Through failure on the part of governments and municipalities to inaugurate and systematically carry on preventive measures, this national waste of child life has not been prevented.

Health work in the main has been extrinsic as concerns the home; hereafter it should be intrinsic.

The achievements of philanthropy have clearly demonstrated the beneficial results that can be obtained through the adoption of scientific and rational preventive measures, and have already conserved many valuable lives to the State. The State has already assumed the oversight of the care of the child upon its reaching the school age, and has taken upon itself, or placed upon the municipal authorities, the care and treatment of those then found to be defective or diseased. The State has, in some instances, provided for the medical attendance, sick

insurance and pensions of its citizens in the later years of life, all of which measures have a direct bearing upon the physical condition of the people. The State and municipalities have yet to cover the most important part of the field of preventive medicine, the one big with import to the nation. Whatever is most essential for preventing the great waste of infant life should be adopted as a system by the State and carried out under the direction of the health authorities, thereby permitting of its greatest use and of its uniform and routine application.

The health departments, now vested with power of entrance into the home, should be officered and equipped so that "the child" can be cared for and nurtured through the years most likely to secure the best results. By beginning the work of hygiene at and before birth, many, if not most, of the defects and permanent disabilities which the State is now striving to cure at great cost through the agency of the medical inspection of school children will be prevented. The health department is that most suited to efficiently and economically co-ordinate whatever philanthropic work may be found suited to the peculiar wants of each municipality.

It is now the function of State and municipal health departments to adopt and carry out many of the measures essential in the conservation of child life, such as :—

(1) The inspection of the home—"the hygiene of the home."

(2) The education of the people in everything appertaining to the life and health of "the baby," "the child," as well as "the mother" and "the father," no matter whether this education be theoretical or practical or through executive agencies.

(3) The betterment and maintenance of environment both within as well as without the home.

(4) The oversight of institutions having for their object the care of infants.

The care of infants, both legitimate and illegitimate, is essentially a matter for State and municipal health authorities; the many problems connected with the child and the mother are of such national import that they should no longer be dealt with altogether upon lines of charity, as has been the custom in the past.

The time has arrived, and their lives are so precious, while the magnitude of the work is such as to command from governments and municipal authorities their serious attention. It is more paramount than the building of navies and the training and equipment of armies for defence. To accomplish the objects we have at heart means the expenditure of money, as the work cannot be begun or operated without cost. When once instituted under State and municipal legislation and aid, the results will be so great and manifest that the nation or people which engages in the hygiene of the child will not turn back, but will go on to better and higher things.

The possible lines of operation may be considered as either State or municipal. As the former is the power which is supposed to legislate for the good of all, and as there are some portions of health work which can be best instituted and carried out by the greater body, so it is in the case before us. The State can by legislation bring into operation and by proper supervision co-ordinate the many and diverse channels along which health authorities could work, and at the same time co-operate with those desiring to assist along the lines of philanthropy. The State is the one authority best fitted to institute some system of insurance whereby material assistance will be assured to mothers and their offspring; and it might properly lend financial aid to the institutional portion of the work.

The local boards of health should extend their

work directly into the home, and maintain for this purpose an efficient staff of medical and lay officers whose duty it would be to inspect and report upon the physical condition of the inmates as well as the sanitary state of the cubical contents of all homes, and at the same time render such sanitary aid as may be found necessary.

In addition to this health work in the home, it is equally essential that local health authorities be charged with: The supervision and instruction of mothers on the care of babies; the establishment and operation of milk stations; the supervision and control of midwives; the supervision and control of all institutional work having for its object the care of the infant and child; the regulation and oversight of child labour; the oversight and regulation of all industrial work carried on within the home.

It may be contended that this important sanitary invasion usurps the sanctity of the home; but, under modern conditions, truly no man or woman lives to himself or herself, and the nation has a right to protect the life and prevent disease and disability amongst those constituting its most valuable asset.

It is also the duty of the State to provide for, or assist in providing for, the oversight and, in many cases, the care of the infant—the more so that it is now its function to control the education of the child, or maintain an oversight of the factories and workshops in which a portion of our adult population spend about eight hours every working day. The perpetuity and prosperity of a nation, as well as its *morale*, depend upon the physical standard of its people, coupled with the high standard of home environment; and this can be best secured by beginning with the care of babies in the homes in which they are cradled, and many improperly provided for in pre-natal days, as indeed from birth, until they reach the school age.

Let health authorities but enter the homes of our people in the proper manner, and by means of competent officers vested with authority and backed with the machinery necessary for this, the highest of all preventive work, and there will be saved to the nation an army of children, there will be such a moral and social uplift that we will wonder why this as yet untrodden field of health work was not entered into long ago.

MUNICIPALITIES AND INFANT LIFE.

By RICHARD CATON, M.D., LL.D.

Liverpool.

THE last half century has witnessed a remarkable awakening among municipalities as to the responsibility resting upon them for the health and life of the people.

The change that some of us have witnessed in our own lifetime is marvellous and full of encouragement for the future; one of its phases is solicitude for the well-being of infancy and childhood.

I propose briefly to trace some of the efforts of one municipality—that of Liverpool—to guard and protect its infant citizens at the time of their entrance into this world, and during the earlier steps of their progress through it. Time and space will not allow me to go beyond the period of infancy. The changes I have to narrate are largely the result of the labours of our Health Committee and of our excellent Medical Officer of Health and his staff. Many of the details are taken from Dr. Hope's Reports.

I am afraid we have not as yet done much in the infants' interest to help the poor woman who is about to become a mother by amending her diet and guarding her from too arduous manual labour. This has been attempted in France; but we have tried

to teach her some general principles in regard to the course of life she should pursue to render herself healthy and fit for the great responsibility of motherhood, and to explain to her the rules that should guide her before and after the birth of her child, for the benefit of both. This is done in part by our schools for mothers.

The vast majority of births are attended by midwives in the mother's own house—provision being made for the transference of the mother to a hospital if difficulty or complication should occur. In former times, the midwife being too often of the school of Mrs. Gamp, a dangerous degree of ignorance and uncleanness prevailed; but by the operation of the Midwives Act of 1902 the perils thus arising have been greatly reduced. During the year 1912 only thirty-five births took place under the charge of uncertified midwives. Moreover, a constant supervision is exercised over the methods and apparatus of the certified midwife, and any woman who is found to be careless and uncleanly is dealt with. As a result, the type of attendance on the parturient woman is rapidly improving; for example, it is the rule that the midwife shall take and record pulse and temperature at each visit. Wherever real difficulty or danger occurs, skilled medical help is obtained at once, or in bad cases the patient is removed to the Maternity Hospital. The results, on the whole, are very good.

The child thus makes his entry into the world under fairly favourable conditions. If there is anything abnormal about him, skilled medical aid is at once obtained; if, for instance, that terrible disease Ophthalmia Neonatorum occurs (a disease which causes life-long blindness if not promptly treated) a specially trained female Sanitary Inspector visits the case, and professional aid is at once secured. Provision has been made for the reception of both

mother and child in a special hospital, and the measures there adopted nearly always save the child's sight.

Under the Notification of Births Act information of each birth is given to the Medical Officer of Health within thirty-six hours, and every mother in the poorer parts of the city is at once visited by a female Sanitary Inspector. More than 20,000 such visits are paid annually. The mother is helped and advised about her own health and that of the child, if such help is needful, while cards giving simple and easily understood rules for the care of the infant are distributed. There is great need for this guidance, for the ignorance of some of these poor mothers is appalling. Such articles of food as red herring or sausage have often been observed to be given to a baby a week or two old, also whisky, brandy, or gin. I once saw a mother cram her baby's mouth with pork pie. All this is done with the best intention, but with most fatal result.

The absolute necessity of feeding from the breast is urged, and the avoidance, if possible, of all other food. When bottles are needed, care is taken to prevent the use of long tubes, or of any kind of bottle that cannot be readily cleansed. Bottles have often been found so foul that the contents when given to an animal have rapidly caused death.

If it is thought that the nursing mother is herself insufficiently fed, rations of good cow's milk are supplied daily for her own consumption by the city. When it is impossible for the mother to give the infant its natural food, and when ordinary cow's milk disagrees, the city provides a form of specially humanized cow's milk of varying strength for different ages at a low price, or, when necessary, gratuitously. The cost to the city of this provision is about £3,000 a year. No food, of course, can be as good for the infant as the breast milk, but still the death-rate

among the 3,000 or 4,000 children who receive this humanized milk is very low, and a great number of lives are thereby saved. In those cases in which unhappily the poor mother is compelled to leave her child and spend the day in labour, the crèches or day nurseries in various parts of the city, established by private benevolence, receive the infant. Its diet is supplemented; it is kept clean and tended during the hours of the mother's absence.

In the primary schools the girls, especially in the higher standards, receive instruction in the simple rules of hygiene and house management, the importance of air, light, and sun, the need of cleanliness of the person and the house, the rules of diet, the evils that follow the taking of alcohol, and the general rules of nursery management and the dieting of infants. These elder girls have much to do with the infants and young children in their own households; they are commonly the nurses of their younger brothers and sisters; they act as sanitary missionaries in the house, and when, in their turn, they become wives and mothers, the knowledge thus acquired will prove of great personal value. Medical consultations for infants have been established in the city.

When a young child ceases to be nursed from the breast much depends upon the cow's milk it is supplied with. Great care is taken in Liverpool to prevent the selling of milk containing tuberculous or any other infective material. Every cow, every cow-house, every dairy, every milk shop, in the city is inspected, and all milk coming from the country (which is much more frequently in fault than the town milk) is carefully tested. In order to detect the presence of tuberculous virus in the milk, samples are constantly being administered to guinea-pigs, and if tubercle is thereby caused in the guinea-pig it is invariably found that the milk given has come from a cow infected with tubercle, and the milk from that

farm is no longer allowed to enter the city. Thus the young are in most cases guarded from this form of tuberculous infection. Cases of severe whooping cough and measles in infants are taken into Corporation Hospitals, whereby recovery is rendered more rapid, and the spread of infection is checked.

About 84 per cent. of the cases of scarlet fever occurring are taken into Corporation Hospitals with conspicuous advantage. Whereas fifty years ago out of every 100,000 of our population 200, 300, or even 370 deaths took place annually from scarlatina, the mortality now is only from 15 to 30 in the 100,000.

Small-pox among vaccinated children does not occur at all with us during the first two years of life, but among the unvaccinated it causes a mortality of 57 per cent. of those attacked. This lamentable fact is, of course, entirely due to unwise legislation. While the disease is merely sporadic as at present, segregation in hospital usually keeps down the number of cases, but if an epidemic should occur there will, I fear, be a great massacre of the innocents, as well as of older persons, for the number of the unvaccinated is increasing yearly.

The diphtheria mortality in infants, as well as in adults, has been greatly reduced.

One of the most serious causes of infant mortality is the prevalence of epidemic or zymotic diarrhœa, occurring in the autumn, especially in years of high temperature and small rainfall. This ailment seems to be due to errors in diet, especially the use of food which is decomposing and becoming putrid. The infective action of the common house-fly appears to be in part the cause of this decomposition. Infants fed from the breast suffer scarcely at all, those fed otherwise show a mortality fifteen-fold as great. We lose from 500 to 1,600 children per year from this cause.

Strenuous efforts are made on the one hand to instruct the people as to the feeding and management of infants, and on the other to banish the causes of contagion. Ash-pits in which offensive refuse accumulates are being rapidly done away with. Over 116,000 closed metallic ash-bins have been substituted; these are emptied every two or three days. A strenuous campaign against the household fly is being carried on. The accumulation of stable or cow-house manure is prevented in densely populated areas. More than 400,000 rooms are examined every year, defects reported and cleansing orders issued when needful. Everywhere an abundant and constant supply of pure water is given to the people. Cellar dwellings are being done away with as rapidly as possible; none having a floor level more than 2 ft. below the street are permitted, and of these only 1,600 now remain. More than 11,000 dirty or infected houses are purified, and usually about 29,000 sanitary conveniences are cleansed and put in order annually. Every drain in the city, of course, is systematically flushed with the hose at frequent intervals; streets and passages are cleansed with the hose, once or twice, or thrice a week, where it is found needful, and about one million square yards of street surface are treated with dust-fixing composition.

During the autumn of 1911, when the great general strike in Liverpool stopped all sanitary work, such as the clearing of ash-bins and ash-pits, and when difficulties occurred in the food supply, zymotic diarrhœa became more fatal than in any other year.

Insanitary dwellings are an important cause of infantile mortality. The Municipality has destroyed a vast number of them, caused the alteration and amendment of others and erected some thousands of healthy and sanitary houses which are placed at the disposal of the poor families ejected from

insanitary dwellings. These tenants do not pay a rental representing the full cost of their dwellings, and the remainder of the cost falls upon the rate-payer. Under these circumstances it is reasonable that a strict supervision of these tenements should be exercised. After due warning, drunkenness and other vice or misconduct, dirty or disorderly habits render the tenant liable to expulsion. The results have been greatly improved conduct and a marked fall in the death-rate, especially among the infants. Year by year this reform is being carried out with satisfactory results. Furthermore, wide streets and open playgrounds for the children are being provided. Also a great number of public parks and open grassy spaces with trees and seats where infants and children can enjoy the sun and air. These are expensive, but are important boons for the congested population of a city.

There are, however, certain other factors which are of great moment in determining the death-rate among infants. The morals, the intelligence, the common-sense of the parents, especially the mother, are of great importance.

In a group of three or four families occupying adjacent houses, and engaged in the same kind of labour, the widest differences in infant death-rate are found to prevail. In one family all the children survive, while in a second only half, and in a third all or nearly all die. Drunkenness and other vices, carelessness, ignorance, and idleness are the causes. The removal of these evil moral conditions is a more difficult task than the amelioration of mere physical defect. Religious and moral teaching, education and the practice of temperance are the remedies. All our primary school girls are now being taught hygiene, home management, sewing, the details of the nursery, and the feeding of infants, and they show great interest in these studies, both in theory and by practi-

cal experience in the crèches. The teachers receive special training in these subjects.

The boys also are receiving like instruction, though on a more limited scale, in such subjects as temperance, and we must hope this valuable instruction will show important effects. The keen interest both boys and girls take in this subject is quite remarkable. Enough time has not yet elapsed for the results to show themselves.

Finally, it is encouraging to note that a great fall in the death-rate of infants has already been secured. In the year 1874 and about that time, out of every 1,000 children born, over 230 died during the first year. A gradual improvement has taken place ever since, with slight upward and downward fluctuations; last year this 230 per thousand had been reduced to 125 per thousand. This, of course, is still far too high a rate, but we hope for better things in the future.

I have read this paper in the hope that we may hear something of the work done by other municipalities who are making like efforts, and that we may learn from one another.

THE ORGANIZATION OF INFANT MORTALITY WORK IN CLEVELAND, SHOWING THE RELATION BETWEEN A MUNICIPALITY, A BABIES' DISPENSARY AND A UNIVERSITY.

BY DR. H. J. GERSTENBERGER.

Associate Professor of Paediatrics, Western Reserve University; Medical Director of the Babies' Dispensary and Hospital; Director of Department of Child Hygiene, Cleveland, Ohio.

THE presentation of this subject is primarily due to the request and suggestion of the Foreign Hon. Secretary, Dr. Janet Lane-Claypon, who had an opportunity, while attending the last annual meeting

of the American Association for the Study and Prevention of Infant Mortality, to personally inspect the infant mortality work in Cleveland ; and, secondly, to the assumption that the story of how in Cleveland an ideal organization in the rough has gradually been developed might act as a precedent and stimulus to other communities, especially to those who at the first glance have no such possibilities, but who, nevertheless, have them in a latent form.

For every combat there exists an ideal plan which takes into consideration not only the needs of the present, but also those of the immediate future and distant future as well, and which accomplishes the best result with the least expenditure of time, energy and funds.

Besides such an ideal plan, however, there is, as we all well and sadly know from experience, the practical plan of the moment, which means a plan that embodies as much of the ideal plan as is practical or politic at the time being.

Although no big work can be built without an ideal plan, yet the rapidity with which this ideal plan is fulfilled depends more upon the practical plan than upon the ideal plan itself. It is far more easy to make the ideal plan than the practical, for the simple reason that for the building of the former nothing more is necessary than a thorough knowledge of the causes of the conditions to be wiped out and the best means to remedy the same, and still better to prevent their occurrence altogether ; whereas for the development of the latter there is necessary, in addition to this thorough knowledge of the subject, a thorough acquaintance with all of the agencies of a community that might in the course of their routine work or otherwise be helpful and useful in the actual campaign, and also the ability to choose the most opportune time and place to bring about this co-operation. This acquaintance with the various possibly helpful agencies of a community does

not simply mean the knowledge of their individual names and the type of work they are doing, but implies a personal acquaintance with the individuals in charge, a knowledge of the ideals of their own work, a thorough inspection of their machinery and working methods, an attempt to view their work as well as one's own from their view point—*i.e.*, putting oneself in the other person's boots, and to see and plan how to help them—an attempt to view their work from one's own view point, and to see and plan how they can help, or even modify their own activities to be better able to aid without harming themselves and the general development of the community along health and social lines.

The success and the organization of a broad work in Cleveland is due far more to the accomplishment of this practical plan than to that of any one ideal, although the latter has not been absent.

Before picturing Cleveland's progress in its infant mortality work, it will be well to briefly describe the environment in which this work was allowed to grow up.

Cleveland is a city 117 years old, and has a population of some 630,000 people. In 1900 its population was in the neighbourhood of 300,000. So its development into what we may call a large city has occurred rather recently, and this fact is the main reason why the most important of Cleveland's philanthropic health and social organizations are of comparatively recent birth, which again is responsible for the absence of hard and fast customs, practices and precedents, which we are told exist in the older larger cities and are a stumbling-block to those who wish to attempt intimate and efficient co-operation.

There is, however, another reason why co-operation and constructive work are comparatively easy in Cleveland, namely, the fact that practically all of Cleveland's important charities and social institutions

are financed by a relatively small group of Cleveland's wealthy and well-to-do men and women, who are sincere in their purpose, who wish the same methods and soundness of principle employed that brought them success in business, and who are interested in the constructive development of the whole health and social field rather than one department of the same to the exclusion of the rest. How such a status of affairs is bound to promote rather than to handicap co-operation amongst the philanthropic health and social agencies can readily be understood.

Another important factor in making the environment for health and social work better in Cleveland than in most other cities is the awakened and advanced public opinion on health and social matters, and the high intelligence and personal interest of the men in political control of the municipality.

The first attempt to reduce the infant mortality of Cleveland began in 1902, with the formation of the Milk Fund Association by a public-spirited lady, Miss Edith Dickman, aided by her advisers, Drs. H. H. Powell and J. J. Thomas. During the first two summers the activity of this Association consisted in supplying modified milk to babies who were brought to the physician in charge for examination and treatment. No home visits were made, nor was an education of the mothers attempted. Owing to the great expensiveness of the modified milk but relatively few infants could be cared for, and the Association then decided to change its activity to one of supplying a good raw milk at a low price to anyone who applied. In order to be sure of a good supply of milk, Miss Dickman gained control of a farm and gradually developed therefrom a dairy farm producing from tuberculin-tested cows a milk with a low bacterial count. The development of the farm was a big accomplishment, but it was, of course, the only one, for owing to the lack of funds no investigations

regarding the health and home surroundings of children receiving the milk could be made. This was the extent of the work until 1906, when the writer, after having had in 1905 the privilege to work in the newly opened Saeuglingsfuersorgestelle III. of the Schmidt-Gallische Stiftung in Berlin with the physician in charge, now Professor Salge of Strasburg, was asked by Dr. J. H. Lowman, the physician first among those of Cleveland interested in the prevention of disease by social improvement and education of the public, to attempt an improvement of the infant mortality work in Cleveland. He pointed out the existence of the Milk Fund Association and also that of the Visiting Nurse Association, an organization sending nurses into the homes of the sick and needy, and furthermore, the possibility of effecting a co-operation that might enable the establishment of an institution like the one the writer had described to him, which combined medical examination, supervision and directing of the work, nursing care and supervision, especially in the homes, together with the simple milk-station. This suggested co-operation was then effected, and on July 5, 1906, the Infants' Clinic of the Milk Fund Association and the Visiting Nurse Association was opened. In this co-operative plan the Milk Fund Association supplied the milk, both in bulk and in modified form, the Visiting Nurse Association the nurse to aid the physician in the clinic and to control and educate the mothers in the home, and Dr. J. J. Thomas and the writer gave their medical service.

This clinic was placed in the poorest, most populated part of the city, but in order to emphasize the great need of such work, patients from all parts of the city—provided that they were financially unable to supply their own physician—were admitted. The attendance grew rapidly, and so it became evident to all medical and lay people who had become intensely

interested in the work of this little clinic that growing space had to be provided. This was accomplished mainly through the efforts of the much-lamented Dr. E. F. Cushing, who had long ago hoped and wished for a babies' hospital, and who now saw here the opportunity to awaken the interest necessary to establish this much-needed institution. In December, 1906, as a result of Dr. Cushing's efforts, the Babies' Dispensary and Hospital was incorporated to carry on and develop the work of the Infants' Clinic; ground was purchased and plans were drawn of a group of buildings consisting of a large dispensary and nurses' home, a hospital, an isolation house, and a milk laboratory. On April 1, 1907, the writer became medical director of the institution, gave up his practice and devoted his entire time to the development of the work. In May, 1907, one of the large frame houses on the purchased property was remodelled and used as a babies' dispensary, where both well and ill infants were cared for. One of the rooms of this building was equipped and used as an emergency hospital for desperately ill babies for whom no beds were available at the time in any of the general hospitals of the city. Another reason for having this room was to emphasize the crying need of hospital beds for sick babies to the lay people interested in the work.

Two other rooms of this same building were used as the milk laboratory, where most of the milk used was put into quart and pint jars, where also milk was modified, poured into tubes and pasteurized for those infants who were very ill, and whose parents were for some reason—sickness, ignorance, too much work, &c.—unable to prepare the baby's food at home. At this stage the Milk Fund Association was still in existence, and inasmuch as it had set for itself the work of distributing good milk in pint and quart jars it carried the expense of this part of the milk

laboratory. At a later date the Milk Fund Association voluntarily sought amalgamation with the Babies' Dispensary and Hospital, transferred all its possessions to the latter institution, and in its last report urged its supporters to now aid the Babies' Dispensary and Hospital as they had the Milk Fund Association in the past.

This amalgamation brought to the former the control of the dairy farm, which had, however, for some time been regularly supervised by the medical director of the Babies' Dispensary and Hospital as a trustee of the Milk Fund Association.

The work of the Babies' Dispensary grew with rapidity so that the large frame building became too small. For this reason and also for the more important one, to encourage more mothers to come with their well babies, branch dispensaries were opened in the most crowded districts of the city. These were most simple in their arrangement, which was possible because they were used for well babies only. (One waiting-room, one examining and weighing-room, chairs, tables, stove and cupboard.) These were the Prophylactic Babies' Dispensaries, as they are called in Cleveland. Whenever an infant attending one of these dispensaries became ill it was sent to a private physician, or if its parents were too poor, to the Central Dispensary in the frame house. At this Central Dispensary the most of the work consisted in caring for ill infants, but well babies from the immediate district about it were also admitted.

During 1908 six branch dispensaries were opened and the city accordingly divided into seven districts—one district for each of the branch dispensaries, and one for the prophylactic work of the Central Dispensary.

The Central Dispensary acted as the clearing-house of the entire work, and was the hub of the wheel. The methods used by doctors and nurses in

examining and caring for the patients, in solving social problems, &c., are the same in each dispensary. This important uniformity has been brought about by requesting both doctors and nurses to do duty at the Central Dispensary, in order to be eligible for duty at the branches. The nurses continue to keep in direct touch with the Central Dispensary by reporting there at a definite time every day, by being on duty there on certain days during the dispensary hours, and by attending a nurses' meeting once per week.

It is impossible at this place to go into the real detail of the organization, although there is nothing more important to the accomplishment of real work, especially by the nurses, than a system carefully worked out, supervised and constantly remedied to meet new needs and developments. In the work of establishing a system the writer has been materially aided by his ever-ready and able superintendent of nurses, Miss H. L. Leet.

The scheme of centralizing as much of the work as possible was also carried out in the milk work. All of the milk was bottled—as stated before about 90 per cent. in pints and quarts and 10 per cent. in modified tubes—at the Central Milk Laboratory and delivered from here, at first per hand-cart, then per horse and wagon, and finally per automobile, to sub-stations which were in grocery stores, drug stores, meat shops, &c., near the homes of groups of patients. The orders and prescriptions for milk were telephoned daily at about noonday to the Milk Laboratory by the nurses in charge of the branch dispensaries. They were enabled to do this because the branch dispensaries (prophylactic babies' dispensaries) were open in the forenoon. This had the further advantage that patients found ill at the branch in the morning could be sent to the Central Dispensary, which was open during the afternoon. This arrangement further made it possible for the nurses to be on duty at the

Central Dispensary, to accompany the sick patients there and to keep in touch with the so-called sick-work—an important factor in keeping up the interest of the nurses in their difficult work.

The material at the Central Dispensary was also used for teaching medical students. This was instituted by Dr. E. F. Cushing, Professor of Pædiatrics at the Western Reserve University, who ordered that the seniors receive their practical training in the diseases of infants at the Central Dispensary, and who placed the medical director of the Babies' Dispensary on the University teaching staff, and entrusted to him the teaching of nutritional disturbances and infant feeding, and so established a connection with the medical school.

The character and development of the work during the next two years made it seem advisable to build, if the money was not ample for the erection of the entire group, at first the dispensary and milk laboratory rather than the hospital. This was the plan followed and in the spring of 1910 the present Central Dispensary and Milk Laboratory were built as a memorial to Mrs. Anna R. Wade, mother of the donors, Mr. and Mrs. J. H. Wade.

From the very beginning of the work numerous lectures on the causes of infant mortality and the means to prevent them were given in popular form all over the city, wherever an audience could be obtained. This is mentioned because this activity undoubtedly made many individuals acquainted with the Association's work, and thereby helped make friends for the institution's cause.

The public press also became interested and was so well managed by our superintendent of nurses, Miss Leet, that, when in 1911 it was found that the City Council had \$10,000.00 in its treasury to be used in some profitable manner, it voluntarily began a campaign that not only gave the \$10,000.00 to

the Board of Health for infant mortality work, but also made the Babies' Dispensary advisers to the former in the manner of the application of the funds, and ended in establishing a department of child hygiene at the Board of Health with the Medical Director of the Babies' Dispensary and Hospital as director thereof. This established a direct relation between the municipality and the private philanthropy.

As soon as the money was available five new prophylactic babies' dispensaries were opened by the Board of Health, which assumed the same relation to the Central Dispensary of the Babies' Dispensary and Hospital as did the regular branch dispensaries of the latter. So at this time, July, 1911, Cleveland had eleven prophylactic babies' dispensaries and one central dispensary, the latter acting as the hub of the entire work and caring for all of the sick and for the well babies of its immediate district. After an elapse of three months it was found that at the close of the year money would still remain in the treasury of the Department of Child Hygiene. So five of the branch dispensaries of the Babies' Dispensary and Hospital were transferred to the Board of Health, now making ten prophylactic dispensaries in charge of the Department of Child Hygiene. During the first half of 1912 the last branch of the Babies' Dispensary and Hospital was transferred to the Department of Child Hygiene, and in July, 1912, the budget of the latter was increased sufficiently to permit the addition of two more, making a total of thirteen, and at the present writing the total will have increased to fifteen. The two prophylactic babies' dispensaries opened by the Department of Child Hygiene in July, 1912, were placed in the immediate neighbourhood of the Central Dispensary of the Babies' Dispensary and Hospital, in order to entirely relieve the latter of its "well work" at the Central. This arrangement gave to the Department of Child Hygiene all of the prophylactic work,

and to the Babies' Dispensary and Hospital all of the "sick" work, and so markedly increased the value of the Central Dispensary as a teaching place for medical students in the diseases of infants and young children.

The transference of its six branch dispensaries to the Board of Health enabled the Babies' Dispensary and Hospital to apply its funds to the development of other weapons in the fight for the betterment of infant life. An enumeration of these will suffice :—

(1) A nurse devoting her entire time to the prevention of blindness by answering calls to infants with sore eyes, and seeing to it that they receive proper attention at the hands of competent physicians.

(2) A boarding home system of one child per home, one nurse devoting her entire time to developing proper homes and controlling them, and the children they accept and care for.

(3) A nurse devoting part of her time to demonstrate to the Board of Education the possibility of teaching infant hygiene to the seventh and eighth grade girls of the grammar schools.

(4) A nurse devoting her entire time to teaching and training nurses in this special work.

(5) The operation of the babies' ward of the Children's Fresh Air Camp, another philanthropic institution caring for children during the summer months, in conjunction with this institution.

Of the above the nurse doing ophthalmia neonatorum work has been transferred to the Department of Child Hygiene. Still another has been added by this department, and a third delegated to it by the State Commission for the Care of the Blind, to control midwives and help care for children and adults having dangerous eye diseases.

That there is no one-sided co-operation between the Department of Child Hygiene and the Babies' Dispensary and Hospital, to the advantage of the latter, is proven by the fact that all of the milk used

at the Board of Health Prophylactic Babies' Dispensaries is supplied by the Babies' Dispensary and Hospital. In this connection it may be stated that the Municipality will, in all probability, produce its own milk in the near future, inasmuch as it owns and is developing a farm of some 2,000 acres just outside of the city limits.

From the description so far given, it is already clear that the rôle played by the Babies' Dispensary and Hospital as a philanthropic institution has been one of pioneering, demonstrating and proving the need and value of certain measures; that of the Municipality of accepting weapons found sound and able, and using them to the fullest degree possible in the fulfilling of one of its most important duties—the protection of the health of its infant population.

The Babies' Dispensary early in its life insisted upon the entire time of its medical director, and so gave the latter the opportunity to keep in touch with the progress in scientific pædiatrics, and this fact more than any other is responsible for the respect that the institution enjoys amongst the important medical men, the respect that has enabled it not only to intimately co-operate with the Municipality, but with the Medical Department of the Western Reserve University as well.

The climax in the co-operation with the latter came with the beginning of the school year 1912-13, when the writer, after becoming the successor of Dr. Cushing at the Medical School, succeeded in having eight hours placed upon the *compulsory* curriculum of the senior year for practical training in the social medicine pertaining to infant mortality work. This training consists in demonstrating and explaining in detail the work of the physician and nurse in the Central Dispensary of the Babies' Dispensary and Hospital, in a prophylactic babies' dispensary, and in the "blind" and "midwife" work of the Board of Health, in the home of a patient, in one of the Babies'

Dispensary and Hospital boarding homes, and in the co-operation with various philanthropic associations, as the Associated Charities (material relief), Humane Society, Juvenile Court, Tuberculosis Dispensary, Department of Housing and Sanitation of the Board of Health, Visiting Nurse Association, Day Nursery Association, Blind, &c. Besides the eight hours devoted to this social medical work an additional eight are spent in the milk laboratory of the Babies' Dispensary and Hospital, where under direction the students personally prepare the various foods. One or two lectures on the general aspect of infant mortality work are given in the course of the regular lectures on pædiatrics.

From this brief description it can be seen how the University has been given the advantage of using the teaching facilities of a philanthropic institution, the Babies' Dispensary and Hospital, of a municipal institution, the Department of Child Hygiene of the Board of Health; and on the other hand the Municipality and Babies' Dispensary have the satisfaction and pleasure of knowing that they are helping to bring about a better training of medical men. And what is of greater importance, both to the work and to the medical profession itself, than the thorough training of the future advisers of the mothers and of the nation in preventive health measures?

As a brief means of recapitulation the accompanying diagrams show the working scheme as it to-day exists between the Babies' Dispensary and Hospital, the Department of Child Hygiene of the Board of Health, and the Department of Pædiatrics of the Western Reserve University.

In this brief sketch it has, of course, not been possible to picture all of the various co-operative activities in Cleveland's infant mortality work, and, therefore, it will be in order to simply state that in carrying out the work planned to improve the chances

DIAGRAM I.

PRESENT ACTIVITIES OF BABIES' DISPENSARY AND HOSPITAL, BOARD OF HEALTH, AND WESTERN RESERVE UNIVERSITY, CO-OPERATING IN THE REDUCTION OF INFANT MORTALITY IN CLEVELAND.

Director of Entire Work.

BABIES' DISPENSARY AND HOSPITAL.

(Medical Director.)

Central dispensary for ill infants and young children.

Central milk laboratory supplying needs of Babies' Dispensary and Hospital and Board of Health.

Training of medical students by practical experience with ill infants.

Training of medical students in milk laboratory.

Training of nurses of Department of Child Hygiene and of special classes.

Boarding home system—one child per home.

Teaching of infant hygiene in public schools.

Popular educational lectures.

Outdoor ward during summer months.

Babies' ward of Children's Fresh Air Camp (summer).

Wet-nurse bureau.

Sewing-classes for mothers (Prophylactic Babies' Dispensaries, Department of Child Hygiene).

BOARD OF HEALTH.

(Director of Department of Child Hygiene.)

Thirteen prophylactic babies' dispensaries.

Two nurses for ophthalmia neonatorum work.

One nurse for control of midwives and neglected eye cases of older children and adults.

Use of Prophylactic Babies' Dispensaries and of ophthalmia neonatorum material for teaching medical students and nurses.

Use of Prophylactic Babies' Dispensaries for mothers' sewing-classes in conjunction with Babies' Dispensary and Hospital.

WESTERN RESERVE UNIVERSITY.

(Associate Professor of Pediatrics.)

Training of medical students in diseases of infants, especially nutritional disturbances, infant feeding, preparation of various foods at milk laboratory of Babies' Dispensary and Hospital; general aspect of infant mortality work, and special parts of it by practical experience in machinery of Babies' Dispensary and Hospital, and Department of Child Hygiene, Board of Health.

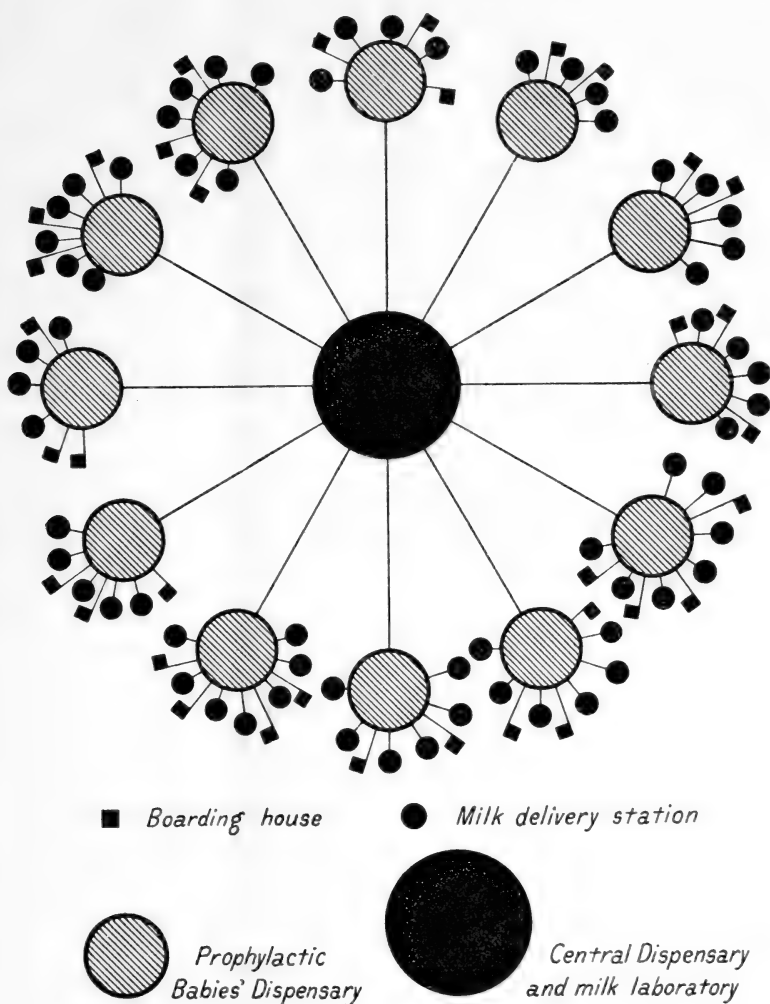


DIAGRAM II.

Showing the co-operation between the Babies' Dispensary and Hospital and the Department of Child Hygiene, Board of Health, in the operation of 1 central dispensary and milk laboratory, 60 + milk delivery stations, and 35 + boarding homes of the former, and 12 + prophylactic babies' dispensaries of the latter.

of the infants the older children and adults are not being overlooked. On the contrary, they are being considered quite as much as the infants, especially by the nurse who continually comes in contact with them in the home, and are when in danger or already ill referred to the proper authorities for aid and advice.

The great importance of the infant mortality work does not lie solely in the improvement of the chances for the infants, but for those of the adults as well. The infant simply is a more sensitive and delicate indicator, and that is why there is ample justification in attaching the greatest importance to the work that has as its first aim the prevention of sickness amongst infants and children.

THE FEDERAL CHILDREN'S BUREAU OF THE UNITED STATES OF AMERICA. SOME ASPECTS OF ITS PRESENT WORK.

By Miss JULIA C. LATHROP.

Chief of the Bureau.

THE Federal Children's Bureau is the result of efforts lasting for ten years to secure a provision by which the general Government should create a special agency devoted to the interests of the children of the nation, with methods of investigation and publicity analogous to those through which the various Bureaus of the Department of Agriculture have vastly increased the productiveness of the soil and the welfare of farmers in this country. In these efforts many organizations and individuals joined, notably the National Child Labour Committee, various settlements and women's clubs, societies and associations engaged in the active work of caring for children and protecting the public health. So that the Bureau went into operation with a remarkable backing of public interest and goodwill.

The Children's Bureau was established by Act of Congress on April 9, 1912, although it did not go into operation until August 23 of the same year, when the appropriation for its maintenance became available. The statute defines its duties thus:—

“The said Bureau shall investigate and report to said department upon all matters pertaining to the welfare of children and child life among all classes of our people, and shall especially investigate the questions of infant mortality, the birth-rate, orphanage, juvenile courts, desertion, dangerous occupations, accidents and diseases of children, employment, legislation affecting children in the several states and territories. . . . The chief of said Bureau may from time to time publish the results of these investigations in such manner and to such extent as may be prescribed by the Secretary of Commerce and Labour” (now Secretary of Labour). For the discharge of these duties, the statute provides a staff of fifteen persons and an annual appropriation of about thirty thousand dollars.

As to the scope of the Bureau—“all matters pertaining to the welfare of children and child life”—this provision indicates that it covers all the children of the nation. But the statute does not define a child, nor indeed is there any uniform authoritative definition as to the age at which childhood ends. If we turn to the last Census, we get a view of the numbers of American children, divided according to the Census method into five-year age groups. The group up to 5 years shows 10,631,364 children; 5 to 9 years, 9,760,632; 10 to 14 years, 9,107,140; 15 to 19 years, 9,063,603. So that, if we were to limit our attention to children before they reach the school age, we should have a field of over 10 millions of children. If we enlarge the scope to include the children up to the close of the standard school period—14 years—we should have twenty-nine and a half millions. And if we add the nine million odd young people under 20,

we should find that the Bureau might claim that thirty-eight and a half million children were included within its purview.

It is apparent that this is a bureau of investigation and publicity, and although it is directed to investigate "all matters," that direction is to be interpreted with relation to other existing Government bureaus, notably those of the Census, Education, and Public Health, which have to do with certain aspects of the care of children, and with which this Bureau naturally co-operates.

It is obviously intended that the Children's Bureau shall occupy the field popularly described as that of "child welfare," which must be based upon census enumerations and must touch upon the social, economic and moral aspects of both education and health. It is to be in no sense an administrative or executive body. According to the theory of government in the United States, each individual state stands *in loco parentis* to the children resident within it, and whether they are normal children with normal family protection, or whether they may be defective, dependent or delinquent, it makes and enforces the laws affecting them. The creation of the Children's Bureau in no wise lessens this responsibility, but it does place at the service of the various states and of any association or individual desiring it such information as can be commanded by the Bureau regarding the many aspects of child welfare.

The law itself mentions infant mortality as the first subject to be undertaken, and it is certainly reasonable that the Government should consider first of all this subject—the wastage of human life at the beginning. If the Census authorities are right in estimating that at least 300,000 babies, or one out of every eight born, died in the United States last year before any one of them had lived a twelvemonth—if, of all the funerals in America, one in every five is that

of a child less than a year old—and if, as we are told, at least half of these deaths are preventable by methods that we already know—then the American public cannot disregard the call to action, nor can we ignore the larger implications of social welfare presented by the statement of Newsholme:—

“Infant mortality is the most sensitive index we possess of social welfare. If babies were well born and well cared for, their mortality would be negligible. The infant death-rate measures the intelligence, health, and right living of fathers and mothers, the standards of morals and sanitation of communities and governments, the efficiency of physicians, nurses, health officers and educators.”

Again, we are challenged by the Report of the New York Special Public Health Commission, just issued, which shows for that state that, since 1902, the rural and village death-rate has slowly risen, that it began to exceed the urban death-rate in 1909, and that “since that date the divergence between the two, in favour of the urban death-rate, has steadily increased.”

The Report of the Commission continues: “The work of this Commission may be said to be to ascertain how the rural and village death-rate can be made to follow the urban death-rate in its downward course.” Partly because the limited appropriations forbade the Bureau’s undertaking extensive inquiries for the present, and partly because the great cities of this country have already under way many successful civic and volunteer activities for reducing infant mortality, while the necessity for such work, being less obvious in smaller communities, is not yet thoroughly recognized, it was determined to undertake a series of studies into infant mortality in small industrial centres and rural communities as our first field work, and it is a preliminary statement regarding the method of this inquiry that I should like to submit here.

Our inquiry does not assume to be a medical inquiry, or even one based upon the records of deaths. It is rather an inquiry into the social, industrial and economic conditions surrounding the children born in a given town within a given year, and is an effort to trace every child so born either through that year or as much of that year as he survives.

It was necessary, in conducting an inquiry thus based upon the birth records, to choose localities within the registration area. In the United States, as will be pointed out later, the registration of births is neither uniform nor universal at the present time. Johnstown, Pennsylvania, was selected because its size, situation in a registration state, and general industrial characteristics made it a suitable beginning.

The schedule follows the child through the first year of life in his family surroundings, and in addition embraces a survey of the reproductive history of the mother. It is necessarily intricate and perhaps annoying to the person who must answer the questions.

The inquiry was launched with some anxiety as to how the agents would be received. The field agents were, of course, necessarily women. The law states that "No official or agent, or representative of said Bureau shall, over the objection of the head of the family, enter any house used exclusively as a family residence." The instructions to the agents were, in addition to this, that they should enter no home without the goodwill of the woman at the head of the family, and for two reasons—first, because the humbler the home, the greater its need that the Government should recognize its dignity; and because, further, without the goodwill of the woman at the head of it, no schedule could be prepared which would be worth writing down. It was doubtless an aid in securing the co-operation of the mothers that the schedule was arranged so that the

name and address appeared on a perforated slip which was removed in the mother's presence, thus assuring her that the schedule was returned to the office without a name upon it, and that the Government only desired the facts, without any tinge of personality.

Fifteen hundred and fifty-eight schedules were secured. It is interesting to note that there were two refusals.

It is obvious that such an inquiry is absolutely democratic, since it must follow the history of every baby wherever born, if born within the given year. The agents found everywhere a cordial reception. Whether among the foreign-born women who must be visited with an interpreter, or in the American quarter of the town, the mothers responded to the request of the Government that they co-operate in an effort to learn how to safeguard their own and their neighbours' babies' lives. The State Board of Health sent for distribution in the foreign quarters circulars in various languages on the care of babies. The American mothers took our agents to task because the Government had no instructions in English for them, complaining of the confusion of doctrine among doctors, nurses, neighbours and relatives.

Such an inquiry should bring out an invaluable by-product of local attention, and this is shown in the present instance by the interest of the Health Department, the press, the women's clubs, and the clergy; by renewed public activity in such matters as the disposal of garbage; and by the request of the city that the Department of Agriculture make a thorough examination of the milk supply. This examination is now (June, 1913) under way.

It would hardly seem worth while to take up your time with a description of so slender an inquiry, were it not to be considered the beginning of a series

which is to be carried on, securing comparable data in every instance. The report of each inquiry is to be made independently and published as promptly as it can be prepared. Later it is intended to collate all the material.

There are various aspects of the present work of the Children's Bureau which I will not discuss here, but I may briefly mention that the Bureau has in preparation a series of pamphlets on the care of children, beginning with one upon pre-natal care; that it has ready for the press the first instalment of material which will appear as a statistical handbook, embodying the figures of the last United States Census relating to children, rearranged for convenient use by those interested in the welfare of children.

I wish to mention particularly certain activities closely related to the inquiry into infant mortality. There will issue from the press in a few days the first of a series of annual bulletins on Baby Saving Campaigns, entitled "A Preliminary Report on what American Cities are doing to Prevent Infant Mortality." While this material has of necessity been prepared hastily, it contains statements from various cities as to the precise methods of their work, including copies of baby-saving circulars in various foreign languages, so that it is really a handbook for health officers desiring suggestions as to how to go to work in a given town.

There is one important aspect of the efforts to reduce infant mortality which is brought out in this new pamphlet. It shows that, according to the Census mortality figures for the registration area of the United States during the year 1910, nearly 10 per cent. of children dying under one year of age lived less than one day, and 23.5 per cent. lived less than one week. The same figures for the year 1911 show a still more distressing situation. In 1911,

with an increased death registration area, there was a decrease in deaths of children under one year; but those who lived less than one day increased not only relatively but absolutely—from not quite 10 per cent. in 1910, the figure has risen to 12.1 per cent. in 1911, while those living less than one week increased from 23.5 per cent. in 1910 to 27.4 per cent. in 1911. These figures show that the efforts to save babies through pure milk and more intelligent care have produced results in the general decrease in deaths of children, while throwing into marked relief the persistent increase in deaths during the first days of life, which these efforts alone cannot reach.

The New York Milk Committee in its 1912 report gives some pertinent figures in this connection. In that city the attempt was made to reduce, in one restricted area, this large percentage of infant mortality in the first days of life, by getting in touch with the expectant mother as early as possible during pregnancy. This campaign, begun in the summer of 1911, showed a reduction, up to the end of 1912, in this supervised area as compared with the borough of Manhattan, of 32 per cent. in deaths under one month, and of 28 per cent. in stillbirths among 1,938 babies, with two deaths among 1,375 mothers. Similar work for expectant mothers has been undertaken already in other cities, among which are Indianapolis, Providence, Baltimore, Chicago, St. Louis, Detroit, Richmond, Louisville, Milwaukee, Nashville, Cincinnati, Fall River (Mass.), Buffalo, and Boston.

As stated above, the inquiry into infant mortality can only be conducted in communities where there is birth registration. Hence the Bureau is of necessity co-operating in the campaign for better vital statistics and is especially bound to urge adequate birth registration because of the many ways in which accurate birth records may serve the ends of child welfare.

Its first bulletin was upon "Birth Registration: An Aid in Protecting the Lives and Rights of Children." The Notification of Births Act of England provides for notification within thirty-six hours, and the recognition of its value in bringing the immediate care of doctors and nurses to needy families is a highly effective argument in our campaign for early notification. At the present rate of progress, it will be but a few years before there are uniform vital statistics laws throughout the United States. These laws, like those for the protection of children, must be passed by each state individually and cannot be secured by Federal statute.

DISCUSSION.

Mrs. ROGER GREEN (Burton-on-Trent Health Society) said that all they had heard that morning was very interesting, but it was quite impossible of realization in small towns. The question before them was an administrative one, and she thought it was as important a question as they could possibly consider. She would like to ask a question on what she considered to be a matter of vital importance. It was a question which she was at present trying to find a solution for at the Conference. Just before she came to the meeting she had a talk with the Chairman of their Health Committee. She might tell them that she had made a few suggestions to the Health Committee on the matter of infant care, and the town council had defended themselves behind the answer that what she wanted them to do was not legal. They said that it was not legal for them to give infant consultations, so they had to do with propaganda work which they were carrying on in the town. They had thousands who attended their lectures, and they did quite a great deal of work in a general way. They were a small town, Burton-on-Trent, of about 48,000 inhabitants. What she was telling them was really true. They had all their own local associations to keep going, and all this good work about which they had heard so much from the readers of the papers was being kept back through lack of funds, and it had been gently hinted to her that if it could be shown how it was possible for their council—it was not a council of public audit—to legally give them money for their work.

she would personally bring forward such a proposition before the council. She would be very glad if that side of the question could be considered in the discussion—how they could obtain money out of the rates.

Councillor JOHN PHILLIPS (Abertillery) said he wished to say just one word or two in regard to the first paper, which was a most interesting one to him. On the whole he was in agreement with the views expressed in the paper, but in regard to certain matters contained in it, as a member of a public authority it presented some difficulties. To him the housing question was one of the most important matters that affected the health of any locality, and unless the conditions were made quite easy for the local authority to alter the present housing conditions, he was of opinion that they would not make the progress they ought to make. In some of the industrial districts they were faced with the position that an enormous value was placed upon land when it was required for housing or other improvements. When a local authority desired to obtain some land for housing, or even on which to erect schools, they found themselves confronted with a charge of anything between £800 and £1,000 per acre, which was prohibitive for a district already burdened with heavy rates. He would like to say, as far as the reference to health visitors was concerned, that personally he would like to see that made compulsory and he would like to see the local authorities subsidized by the central authorities in that respect. He believed that great good could be achieved by those officers by way of inspection of the homes and by the advice given to mothers, and also by the attention given to the children. He would like to see some readjustment in some form or another to assist those districts which had been referred to in the papers as far too poor to carry out the necessary improvements towards the reduction of infant mortality. At present the districts which were the most heavily burdened by the rates were those districts where the great wealth of this country was produced. The districts which were lightly burdened as far as local rates were concerned were those districts which were healthy and where they had the lowest death-rates. In those districts where infant mortality was high the rates were very, very heavy, and he would like to see some readjustment. By way of illustration, they might take Bath and Bristol. In Bristol, which was an industrial centre, he found that the rates were about 50 per cent. over and above what they were at Bath. Bath was a well-known residential and health resort, and he would like to see a city like Bath come in to the rescue of the neighbouring

town of Bristol, and help to improve the health conditions of that particular town. He believed that some readjustment on those lines would give encouragement to the local authorities who were anxious to improve the conditions existing, but who at present were crippled through the financial position in which they were.

Mr. JOSEPH PLUMMER (Bermondsey Guardians) hoped the Conference would forgive him if he was not so fluent as he would wish, but there were one or two observations he wished to make. At the time the President of the Local Government Board was making his opening speech he (Mr. Plummer) would have liked to have asked him this question—why is it that the local authorities had no power to administer relief, only in kind, while men were out on strike? On the occasion of the last strike at the water-side there were numerous cases of poor women, with seven and eight children, who had to be dependent on what they got from private sources, such as from the *Daily Mail*, the *Daily Chronicle*, the *Daily Graphic*, and several other newspapers which collected money and distributed it by agents amongst the poor who were suffering through the strike. Now he thought it was a very wrong thing indeed that the people should have to rely upon public charity. As a guardian he thought that the guardians ought to have power to be able to administer relief to women and children. They could not do that now unless the men would go into the workhouse. If the men would go into the workhouse they could give the children and the wife Poor Law outdoor relief, but the men would not go into the workhouse because they wanted to be about amongst their fellows. In all strikes there were a great many men who were unwilling to come out but they were obliged to do so, and there was very great hardship amongst the women and children, who were deprived of the necessities of life. It was a very hard thing if they could not relieve such women and children by money unless the husband went into the workhouse. There was another point he wished to mention. If a man took care to insure his life and belonged to a society and he died and the wife was left she had to give a good account of the money which she received from the insurance company. She had to give an account of how she spent that money, and when there were seven or eight children, and she had a paltry sum of £1 or 30s., she had to tell the guardians how she had expended it. He had a case only a short time ago where a poor woman had 30s. from a society. As the guardians were on holiday they could not give her anything—the only thing they could do was to

leave the matter in the hands of the relieving officer, who could give her outdoor relief in kind. The guardians did not meet again until September and it was a very long time for 30s. to last. He wanted the guardians to have power from the Local Government Board that whenever a necessitous case occurred where there was poverty they should have power to relieve it.

Assistant Surgeon-General JOHN W. KERR (United States of America) said he would like to ask Dr. Fremantle a question and shortly explain his reason for asking it. The idea of democratic government in their country and the growth of local government had made them fearful of the largest possible economy in local government. The obligation of the public health performances, on the other hand, had given rise to a demand for great centralization of public health power in public health matters. Dr. Fremantle had spoken in the concluding portion of his paper of the consolidation of the public health service and he favoured a central health organization for this country which would have power over local authorities. He would like to ask Dr. Fremantle what scope such an organization would have, whether it would include England and Wales or England and Wales and Scotland and Ireland and other countries included in the British Isles.

Alderman BENJAMIN BROADBENT (Huddersfield) said he wished to add just one word in regard to Dr. Gerstenberger's paper. He (the speaker) hoped the doctor would forgive him for saying it, but the summary which he gave was not sufficient for those who had not read the paper. He hoped that everyone who had heard the summary and had not read the paper would read it afterwards, because the paper was better than the summary and was well worth reading in detail. When he (Mr. Broadbent) read the paper he almost died with envy because it presented to him an absolute ideal of everything that ought to be done in every municipality in our own country, and of everything that ought to be done in particular in every town. In England they had done it partly, but very imperfectly. The point that struck him as being so extraordinarily good was that in Cleveland they had secured the co-ordination of the municipality with the voluntary; they had secured the sympathy of wealthy people who could well afford to support voluntary work by large contributions and they could do things and make experiments which would hardly be justified by a municipality without voluntary help. But they had not only secured complete co-operation between the municipality and voluntary effort, but they had done a

thing more wonderful—they had secured the co-operation of the medical profession, and when they had a combination of municipal effort with voluntary effort with voluntary contributions, together with the medical profession, they had, it seemed to him, reached the highest point of idealism. In many parts of this country they could secure a certain measure of support of voluntary effort by the municipality, but it was in very few places that they could secure sufficient co-operation between voluntary and municipal work to enable them to do all that they ought to be able to do, especially in regard to making experiments which would not be justified by the expenditure of municipal money wholly. When they could get money with which they could experiment and that they could use for the purpose of establishing such things as they had established in Cleveland, and then secure the support of the medical profession, it seemed to him they had got everything they required. He would like to induce everyone, especially those who were engaged in municipal work, to read Dr. Gerstenberger's paper with the utmost attention and see what could be done in a huge community. They often heard of ideal things being done in a small community, but there they had a city of 600,000 inhabitants, who had reached at one bound, it seemed to him, the ideal of what could be done in regard to this work. He trusted that the excellent example set before them in that paper would act as a stimulus to many of the municipalities and many of the voluntary agencies of this country. (Cheers.)

Miss RENAUD (Newcastle-upon-Tyne) said she would like to ask Dr. Gerstenberger if he could give the Conference a little more information with regard to what was done in Cleveland in connection with pre-natal conditions.

Mr. A. D. D. BANKS (Ashford) said that first of all he had to congratulate very heartily Dr. Fremantle on the very practical paper which he had put before them. In the course of some few years of municipal work he had found that the local authorities were people that needed to be brought up to the mark to do what they could to carry out the powers that they already had in their hands. One was constantly coming into contact with local authorities who looked to the £ s. d. aspect of things and they approached every question from that one standpoint. It appeared to him that too often that was the wrong standpoint—they were studying economy without efficiency of administration, and what often happened was that for the sake of an extra $\frac{1}{2}$ d. or 1d. rate the best interests of a large number of the populace were sacrificed. He would be

delighted to hear that the paper of Dr. Fremantle had found its way into the hands of every public administrator on their local authorities, for he believed that just as there was a large amount of ignorance on the part of the people on whose behalf they administered their laws, so there was a large amount of ignorance to be found within the council chambers of the country, and if the administrators of public laws would only make themselves acquainted with what the people needed, he was quite confident that their good hearts (for half of the people had good hearts) would give them what they wanted. He would like to suggest that those of them who were members of public authorities should see to it that those who were least inclined to take an intelligent interest in that work should be educated up to the duty which they owed to the State and to their native town. He would particularly commend Dr. Fremantle's paper to the education authorities. They found at Ashford, which was an industrial centre containing about 2,000 railwaymen with a population of 30,000, that upon the part of the local education authorities there was great lack of interest in the practical points to which Dr. Fremantle's paper referred. As local authorities they had got to face a new problem by reason of the new condition of things which had been created by the large number of picture palaces that were being opened all over the place. In his town the young people were crowding to these places, and they found that their evening classes were now being forsaken by large numbers by reason of increasing demands of these counter attractions. Only the other day his son came running home from school and said to him, "Father, the manager of the Cinema says we ought to go to the Palace twice a week." He thought they should try and cultivate a liking for the higher things of life in their administrative bodies, on their councils, and in their education authorities, and that would do much towards bringing about a better condition of things as regarded infant life.

Councillor PHILIP BUCK (Tottenham) said he would like to say just one word or two. He could see that there was very valuable matter for consideration in the papers which had been presented that morning, and he hoped to study them more fully on his return home. There was one thing he wanted to impress upon all present. Something had been said about the incompetence and the parsimony exercised by local authorities. He agreed, but after all there was another side of that question. He came from a district which had an estimated population of about 150,000 souls. The education rate in his district was 2s. 9d. in the £, and

with an education rate like that they could judge that other local rates were high in the same proportion. Notwithstanding that, his authority had amongst its members numbers of men who were most anxious to do all that was humanly possible for the amelioration of human suffering and for the saving of child life, and the preservation of infant life, and of the mothers during the rearing of their babies. But they were heavily handicapped, and were at their wits' end to know what to do because they could not find the money. After all with a population like theirs there was a limit to the purse of every ratepayer, and what they said was that while they were paying a rate of 2s. 9d. in the £ for their children for education purposes, while they did all they could for the care of the infants under their charge, other districts were getting off with perhaps half of that rate, and they said that the central authority should be pressed to give them assistance and, so to speak, to equalize the strain that was now put upon particular districts such as theirs. The care of child life was a national question, and the nation should provide the wherewithal, at any rate, to some extent. He granted that localities should have some interest in the matter, but they ought to be assisted by the central authority. He knew that in his own district there existed a feeling sufficiently strong now to do a great deal towards the solution of the problem that had been put before the Conference that day, but he could also say that were it not for the eternal money question they would be able to do a great deal more. The will existed but not the power, and it was in that direction that he would impress upon members of local authorities to do all they could to educate the masses to a full sense of their responsibilities and upon councillors to educate the Government in the same direction.

Dr. CHARLES A. HODGETTS (Canada) said he would like to ask Dr. Gerstenberger what the mortality rate of Cleveland was under its present system, compared with what it was before that system was adopted.

Dr. GERSTENBERGER replied that they were quite in the dark with regard to the births, and therefore they did not know the exact mortality rate. According to the records of the health officer, in 1905 it was 18, and at present it was between 11 and 12, but they had no idea what percentage of the births were sent in to the health officer. They knew exactly how many children died, but they did not know how many were born. It was a sad thing that they could not have those statistics, but under such circumstances there was, of course, no sense in using the statistics at

hand, even though they showed a marked reduction in the mortality rate. One could, however, be absolutely sure of this, that wherever good solid work was being done there must also be a result for the better.

Dr. S. G. MOORE (Huddersfield) said that perhaps Cleveland might surmount their statistical difficulty in this way—they might not be able to know the number of births per annum, but they had excellent census returns made periodically, and by calculating the death-rate of infants per thousand of population, and making a comparison with other places, they could at once put themselves in the position of making a comparison between their existing infant mortality rate and preceding rates, and they could also establish some comparison with other places.

Dr. CHALMERS (Glasgow) said he would not detain them more than a moment or two, but he thought it well to make a reference to one part of the subject that they had wholly left out. They had discussed the responsibilities of the Central Government, and they had discussed the responsibilities of local authorities, but they had not discussed the responsibilities of the parents. He put the problem in that way because of this—they had a Notification of Births Act, which brought to them pretty early knowledge regarding the birth of a child. But the condition of the law at the moment was, he believed, such that if a father had neglected his wife the law could take no action in the matter; in other words in this matter it was not a crime to neglect a woman who was about to become a mother. The law stepped in directly the child was born, and if the child were living the law could then prosecute the father for failing to provide for the wants of his child. They wanted co-ordination in some way—they wanted more power, they needed the law altered in that matter. There was another sense in which they wanted co-ordination. The Notification of Births Act gave them knowledge of the children who were born, but it did not go any further. If an illegitimate child were born that child passed out of the knowledge of the authority altogether, if it went under the care of the Parochial Board or the Unions. There was co-ordination wanted there. There was too much splitting up of responsibility in regard to this work of looking after children among the various authorities, and in his opinion they needed the authorities to be co-ordinated, and in that way they would do better work.

Councillor IRVING (Burnley) said he came from that very wicked, very foolish, or very ignorant community, Burnley.

He said that in all seriousness, because the infant death-rate of Burnley in comparison with that of several other towns amply warranted such statements, and on the whole he thought the best that they could say for Burnley was that it was ignorant. But the reason he was there that morning was to say there were other people who were ignorant besides themselves—the central authority was equally ignorant. In one of the papers which had been read part of the work of the central authority was referred to as being a very important part, and that was the work of inquiry. It urged that the inquiry should be extended over a sufficiently large area, otherwise it would not result in much good. The position of Burnley and several other Lancashire towns warranted that there should be a specific and detailed inquiry. He believed that an inquiry would reveal the fact that various local authorities were hampered in their administration, and very often dare not give free expression to their opinions. That could be removed only by the central authority doing as he believed they had done in other cases. For instance, they had an epidemic of typhoid fever, and the Government had sent down special Commissioners to inquire why that thing had happened. The same thing should be done with regard to a town like Burnley and others that had excessive infant death-rates so that exhaustive inquiries might be made. After all, the question was not summed up as between Battersea and Burnley, where the women worked on the one hand and not on the other. The fallacy of that argument was shown by Mr. Burns himself several years ago, when he stated the death-rate of Battersea was equal to that of Burnley now. At that particular moment the women of Battersea were no more working than they were now, and the women of Burnley were working just the same as they were at present, so in his (Mr. Irving's) view the change had come from something altogether different. His municipality had done its level best from the point of view of appointing health visitors. They were supplying milk to feed the children, but they had reduced their death-rate very little indeed. Over against them was the neighbouring town of Nelson. The death-rate in Burnley was very much higher than in Nelson, where the women equally went to work, and where upon the surface the circumstances were exactly the same. He was quite sure too that the town of Burnley was not behind in its housing accommodation; it had a water carriage system of sewage, in fact it practically had all those things that they were recommending. What he contended was that in specific instances where the death-rate had been

maintained at such a high average (they had always been at the top or next to it during the last ten or fifteen years) it was time that a Conference like that should appeal to the Imperial authority to send a special Commissioner into such districts to get at the special reasons why those high death-rates prevailed.

The CHAIRMAN said that if Mr. Irving would do him the honour to refer to the Report which the Local Government Board had just issued he would see on page 65 there was a discussion of the differences between Burnley and Nelson, and in the last sentence of the Report it was stated that many points required to be cleared up, and that local inquiry was needed before any more accurate statements could be made. That local inquiry would be made, and he was sure Mr. Irving would be pleased to hear that.

Dr. FREMANTLE, replying upon the discussion, said that Mr. Phillips had spoken of the housing question, and on that he did not think any more need be said, as they were all agreed as to its importance. Then Mr. Phillips suggested that the appointment of health visitors should be made compulsory. He (Dr. Fremantle) thought that they did not want to insist upon the compulsory employment of health visitors by local bodies where voluntary agencies were doing the work well. He was glad that Mr. Plummer had raised the question of guardians having power to relieve mothers and children during the progress of a strike. They must all recognize the very large part that the guardians had to play in this country as regarded infant mortality. He was afraid they did not recognize it enough, but he was also afraid that to relieve mothers and children during the progress of a strike would involve such large political and economic questions that they would be bringing the subject into the political arena, and therefore it would not be a very easy matter to take up that question at present. Dr. Kerr had asked as regarded the National Central Association what was to be the unit—whether it was to be England and Wales, or whether it should be England, Wales, Scotland, and Ireland. On that point, as they knew, the Local Government Board was at present separate for England and Wales on the one hand, and Scotland and Ireland on the other. That was they had three different Local Government Boards. Whether it would be necessary or desirable to unite them for the purposes of public health was another problem. For that purpose they should treat them as independent centres. As regarded the organization of expert service, in his opinion there would naturally be one for the whole country as there was now in the Army and

Navy; but it might be that they would have separate services for the different countries. Miss Renaud had referred to the question of pre-natal conditions. On that point he would say that it was somewhat premature to discuss the question at the present time. Notification could be adopted at the present time, and they could appoint their health visitors and keep their infant mortality records, but they could only act on the powers which they had, and amongst those powers he would like to call their attention to the fact that under the National Insurance Act they got for the first time a record of the sickness among the great masses of the population. He thought that they must find out from the actual records of the National Insurance Act the sickness prevalent in the country before they could really undertake the problem of tackling the pre-natal conditions on a large scale. He did not think he had anything more to say, as the other points raised in the discussion had been dealt with. Mr. Buck had suggested that local authorities should have help from the State in this matter, and he (Dr. Fremantle) agreed with him, and he had in fact suggested one method of help, and that was that the expert services which he suggested should be paid for by the State.

Professor RICHARD CATON said he had only one word to say on the discussion. The medical consultations to which he had referred in his paper were absolutely free. He had not heard of any opposition from the medical profession in the city, because these medical consultations were restricted to the very poor of the city for whom they were intended.

Dr. GERSTENBERGER said the census statistics could, of course, not be used in the computation of mortality statistics that would be of any value, for the simple reason that the census was taken but once every ten years. So at best one could only compare the rate of two individual ten years apart from one another, and this would in all probability be most unreliable, on account of the various factors that would have to be considered—weather conditions, change in type of inhabitants, &c.

The meeting then adjourned.

SECOND SESSION.

At the afternoon session the chair was occupied for a short time by Dr. NEWSHOLME, and subsequently by Surgeon-General Sir CHARLES P. LUKIS (India).

THE WORK OF VOLUNTARY HEALTH SOCIETIES IN GREAT BRITAIN.

BY MRS. KITSON CLARK.

President of the Leeds Babies' Welcomes Association.

THE Association of Infant Consultations and Schools for Mothers (a department of the National League for Physical Education and Improvement) has just published a detailed report on the work of these societies,¹ and experts at this Congress will measure their scientific value. It only remains for me, a woman and an amateur, to enlarge upon their voluntary aspect, and especially on women's part in it.

Amateur women are out of fashion; the Early Victorian elaborately useless lady was discredited by a better educated generation, who recognized that a lady could remain a lady although she trained for a profession. At first the preparation was regarded as an unfortunate necessity; the ideal lady's education covered too much ground to enable her to excel in any one branch. But now every girl, rich or poor, specializes, and will not practise an occupation in which she is not expert.

Duties are parcelled among experts and soon social, domestic and parental amateurs will no longer bungle over the care of their children, the ordering of their homes, the entertaining of their guests; and each recreation will be practised by its own professionals. Specialists can direct in nursing homes the bodily functions of women weary with piecing the patchwork of other people's effort, which they call their lives; but how will such women learn to deal with

¹ "Infant Welfare Centres: The Work of Infant Consultations, Schools for Mothers, and similar Institutions." By I. G. Gibbon, D.Sc. National League for Physical Education and Improvement, 4, Tavistock Square, London, W.C. Price 6d. net, post free 7d.

a crisis not to be referred to one of their ministers? Carthage will not be able to man her ships.

Homes cannot be made by experts. Wives and mothers must be amateurs in many trades and cannot delegate their responsibilities. A girl's education should first aim to prepare her for her woman's duties. Later she may train to become one of the cool, capable women specialists now eminent in all professions. It takes cement and bricks to make a wall. It takes amateurs and experts to make a comfortable world.

Amateur and expert are required in social work. This distinction is more important than paid and unpaid, though amateur opinion gains some weight if it administers the salary of the expert, otherwise experts are inclined to underrate it. For in destroying the dangers of promiscuous charity and ignorant patronage, science is apt to sterilize the personal element in philanthropy. The modern expert social worker is not parochial—she works in many towns before she reaches her ultimate goal, which is generally London. One locality gains by her experience in another, and her mistakes are left behind her. Lady Bountiful was stationary—her dead self was an uncomfortable stepping-stone and remained a monument of failure, teaching caution. Her granddaughter in town or country is paralyzed by social science. The social expert, impressed by the ignorance of the resident amateur, does not recognize the value of her local knowledge, or remember the permanent character of her ministry. She must go on working among her neighbours when the secretary, the almoner, the inspector, or the nurse have been promoted to work elsewhere and succeeded by younger enthusiasts. Unpaid experts may be permanent and local, but even they may find the amateur's leisure more valuable than her money, although more difficult to use. The professional in one trade is an amateur in another, and a different

training brings a fresh point of view, while the duties of wife and mother provide a training often missed by the professional expert and valuable in itself. Many of the societies to which the majority confide their guineas and their consciences offer examples of a beneficent combination of amateur and expert, and in modern social legislation amateurs are used on advisory committees. Here they feel often superfluous, having no control over the extremely efficient officials. Guardians do better work, being responsible to the electors for the appointment and direction of their officers.

Should health societies be voluntary? If they were all taken over by the State or municipal authorities their enthusiastic experts would not be less efficient as Government officials. The amateurs could be used as visitors and advisory committees; their anxiety respecting finance would be smoothed away. But could any one Government department keep in touch as they do with all existing voluntary societies, with the local sanitary administration, education committee, Poor Law guardians, Insurance Commissioners, &c.?

However superior were the organization and equipment of a Government department, could it be as good an engine for the education of the man in the street as a voluntary society, whose members learn the functions of the different public bodies with whom they work, and whose individual subscribers, either in money or time, feel a responsibility that it is difficult to waken in private individuals, even with regard to the work of their representatives in the machinery of local government?

State or municipal departments might use some amateur effort, but the humble worker, who has little time to spare and makes up in love what she lacks in training, must be left out.

Health societies devoted to the care of mother

and infant are those in which the work of the amateur woman is most important. The source of all disease is now traced to the dangers of infancy, ante-natal conditions and parental irresponsibility. The instinctive love of all women for infants, the sympathy one mother feels for another, make women, amateur and expert, the proper ministers for women and children.

There are 200 such voluntary societies in Great Britain and they have undertaken very wide functions, viz. : Lectures to mothers—on hygiene, home-nursing, infant care, sewing, laundry, cooking, the treatment of incipient rickets, &c., &c. Infant consultations, for which generally a trained nurse is provided and often a doctor; periodical weighing of infants. Thrift and clothing clubs, restaurants for mothers, milk depots, home visiting. Training of workers, men's meetings, girls' clubs, free vaccination, rent collecting, and many other duties.

Of these—

- 17 are entirely municipal schools.
 - 31 are partly municipal and partly voluntary schools, the voluntary element predominating.
 - 131 are entirely voluntary schools.
 - 12 are entirely voluntary babies' clubs in Ireland, branches of the Women's National Health Association of Ireland.
- There are also a few unregistered where nurses' associations have days for weighing babies, &c.

They may be divided into three classes :—

- (A) Voluntary societies which do their own work and by whom no salaries are paid.
- (B) Voluntary societies which pay for the work of experts.
- (C) Voluntary workers under the direction of public authorities.

(A) and (B) work with sanitary authorities though not under them. The adoption of the Notification of Births Act has called many of class (C) into existence. In connection with these societies milk or other food is sometimes given or sold to mothers and infants. No one denies the importance of right and sufficient feeding, but experts differ as to the advisability of *giving* it and the best method of selling it. As the work of instruction is not dependent on feeding, in quoting the costs of various societies I omit the money spent in food. Huddersfield is the best example of class (C). There a few experts direct an army of amateur visitors with excellent results. The greatest example of class (A) is the Glasgow Infant Health Visitors' Association, which had 4,716 infants on its books, 16 branches, nearly 300 voluntary workers, and a yearly expenditure of £25. Its work is mainly done by visitors, but it has lectures, infant consultations, mothers' restaurant, and free vaccination. Manchester School for Mothers, class (B), has 2,057 infants, 113 voluntary workers, four centres and an expenditure of £1,480; it pays six expert assistants. It has more meetings and fewer visits, not so much feeding, no vaccination. Leeds, class (B), comes next in size with 1,412 infants, six branches and an expenditure of £700; 80 voluntary workers. Nottingham, class (C), 1,290 infants, four branches, consultations, lectures and visiting; it has three offices paid by the corporation and a committee, appointed by them. Then comes Birmingham, classes (A) and (B), with four branches and the usual activities. Oxford Health and Housing Association, class (A), does not give its numbers; it has weighing centres, but works mostly through voluntary visitors; it has reduced the Oxford rate of infant mortality to 69 per 1,000.

London health societies come next in point of numbers—Marylebone first and then St. Pancras (the pioneer society in all this class of work), and

many others. In provincial towns the workers and subscribers have a real community of interest with the mothers, whom they serve, as women of all ranks depend on the commercial well-being of the city. But in London conditions are different—there is more money available, more voluntary workers, more experts, but the three are linked by chance or geographical relation, there is no real tie, and neighbours may be widely separated by race, trade or religion. I have not worked in London, and reports show completed work, not difficulties that have been overcome. Local conditions and local difficulties are very important, and I think I can show best the sort of local problems that all provincial welcomes have to contend with in describing those I know.

The Leeds Babies' Welcomes Association receives no grant from any public source. The sanitary department of the Corporation has only six salaried women sanitary inspectors, one to every 56,000 inhabitants, so it is not surprising that the medical officer of health can only afford us encouragement and sympathy. Women sanitary inspectors register and chart at some of our meetings, our superintendents visit the mothers whose names the sanitary office send us, and fill up the official cards, reporting all the mothers on our books. (N.B.—The Notification of Births Act has never been adopted in Leeds.)

Geographical conditions differ in each locality. With us the coal measures end on the north side of the Aire, and therefore the residential quarter stretches into the beautiful country north of the Town Hall, while the greater part of the town lies south, west, and east of it. First the shops, then railways, wharves, river and canal, then works and workmen's dwellings, stretching into the coal country. The town is a collection of small villages with separate industries, still separated by steep hills and valleys now covered by small houses.

Industrial conditions vary in each branch. West Street, west of the Town Hall, is among ready-made clothing works where women are employed. Buslingthorpe, some way to the east, is in a valley of tanneries and dye works. Tanning is going to America, narrow skirts require less stuff, and dye works are working short time; it is difficult to get funds. St. Peter's Square, S.E., is near the markets and the Jewish quarter. Farther east the University Welcome touches the miners' wives, and our centre in Ellerby Road, farther south, is in the middle of Irish Roman Catholics, and works among Irish labourers' wives. Hunslet, due south of the Town Hall, and across the river, says "thou" instead of "you," wears shawls instead of hats, plaits instead of curling-pins. It is immediately south of the great iron works where most of the husbands of our mothers are employed, and no female labour. Holbeck, to the south-west, is in the middle of a huge parish containing nothing but workmen's dwellings, and the new West Leeds Welcome, still farther south-west, touches another group of big works.

Branch committees must, as far as possible, represent local interests and understand local conditions. We try to secure the assistance of local minister, doctor, nurse, or local representative of any existing philanthropic institution, and the artisans' wives are very useful when they will help us, but all sources of local energy are generally overtaxed, and we have to import workers, the wives and daughters of masters of local industries, or anyone else with some local knowledge or interest in the district, although living at the other side of the town. Some have to acquire that knowledge and interest through the Babies' Welcome work to which we persuade them. The nearest volunteer has a thirty minutes' journey, the farthest at least an hour (by tram and walking), double that for going and returning, so it is not surprising we lack amateur visitors.

Leeds methods are on the pattern of St. Pancras. We had five centres in existence in the year ending September, 1912, and at each at least one meeting a week for weighing, infant consultations, health talks, and thrift and clothing clubs; and others for expectant mothers, babies over the year, and classes for sewing, cooking, nursing, &c. The mothers in 1911-12 made 19,448 attendances. There is a trained nurse in charge at each meeting and a voluntary doctor attends for part of the time. Ideally for the weekly weighing day we want five voluntary workers as well as the expert. The other meetings do not need so many amateurs. The experts do most of the visiting; out of 7,501 visits in 1911-12, only 524 were paid by amateurs, but we hope to better that. We had 250 expectant mothers on our books last year, and 284 babies over one year. These are the two parts of the work we are trying especially to develop. We hope to keep the babies on our books until school age. The mothers come only for instruction. They get nothing else but a cup of tea and a biscuit; 685 belonged to our Thrift Club last year, 682 to our Clothing Club, which sold £80 worth of clothes. The big Leeds girls' schools are connected with different Welcomes; the girls help us by sewing, &c., and love to come to our meetings.

The management is voluntary, but is given direction and value by our paid experts. Our superintendent is a fine officer who knows all the mothers in every branch, trains the probationers, and keeps splendid statistics. The rest of the staff consists of six "probationers," ladies who come to us at a reduced rate (£60 a year), to learn babies' welcome work, having already their C.M.B., and a considerable experience of mothers and babies. (If they have no sanitary or health visitor's certificate, we give them facilities for obtaining it.) They take a month of training with our superintendent at the centre, and

then take charge of a branch. All branches are under the superintendent's supervision. This arrangement is economical in salaries, but has the disadvantage of continual change. We look to our voluntary workers who week by week, and year by year, chart, register, &c., to supply *continuity*. A central committee composed of representatives of all the branches appoints the staff and administers the funds. Each branch collects subscriptions for the Central Fund, which are placed to its credit. The cost is allocated on the list of attendances. On our council are doctors and other unpaid experts, and there is connected with each branch an honorary doctor. We have opened two new branches since February, and before that, in spite of a severe measles epidemic, our first six months of work showed an increase of 25 per cent. on last year in attendances.

Amateur and expert are necessary to us ; we are struggling to put into practice expert advice, and to give our poor mothers the benefit of the last teachings of science, and to do this we use the expert women, capable and enthusiastic, but we are dependent on voluntary funds and amateur work. The funds are collected through the widespread interest awakened in our workers who learn as well as teach. There is a valuable exchange of experience, and the well-to-do mother north of the Town Hall learns to know the poor mother in the southern districts, and to be known by her, and a real sympathy is established. In trying to secure health for the rising generation we ordinary women find our vocation. Nature has laid on us the responsibility for the care of young children. In home management a man's ideals must be made effective by a woman's practice. Doctors may reason, but women know.

INFANT MORTALITY IN CANADA.

BY DR. HELEN MACMURCHY.

Toronto.

INFANT mortality in Canada is too high, but you will be glad to hear that it is not quite so high as it was supposed to be by one of our recent visitors, who says in his newspaper in 1912, speaking of the infant mortality of Ottawa: "If infants are polished off at that appalling rate, small wonder that Canada is crying out for emigrants."

Another well-known English journal says in 1911, referring to a visit to Canada: "The disquieting feature is the complete lack of any thinking about the problem. To begin with the babies. Generally, throughout the cities of the Dominion, the infant mortality is terrific, apparently equalling that of the worst slums of Preston and Liverpool."

Visitors, as well as emigrants, are welcome in Canada, especially those from the Motherland. Come one, come all. Come as often as you can, and stay as long as you can. The visitors quoted above were welcome, but they did not stay long enough and did not read the Canadian newspapers *en route*. In 1911 and 1912 Montreal, Toronto, Hamilton, Ottawa and other Canadian papers had frequent editorials and news about infant mortality.

If the travellers had only stopped at Fort William to visit Dr. Wodehouse, the Medical Health Officer there, they would have found that when he entered on his duties, in July and August, 1910, sixty-three babies died (chiefly of infant diarrhœa) and that Dr. Wodehouse did "some thinking about the problem," with the result that while the Pullmans carrying our distinguished visitors rushed through Fort William, he was working to such good effect that where sixty-three babies died in July and August, 1910, only twenty-one died in July and August, 1911.

Quite right that our visitor should mention the infant mortality rate of Ottawa, but why did he not also mention the infant mortality rate of Woodstock, another city in Ontario, in the year 1908, which was only ninety-eight per thousand births? Why did he not refer to the infant mortality of the Province of Ontario as a whole, which was 125 in 1908, 131 in 1909, 120 in 1910, and 117 in 1911?

In 1909 the Hon. W. J. Hanna, Provincial Secretary of Ontario, gave orders for the preparation of a Special Report on Infant Mortality. This was printed by order of the Legislative Assembly, and published early in 1910. As far as the Department of the Provincial Secretary can find out, it was the first special report on infant mortality issued by any Government. This does not show "a complete lack of any thinking about the problem." A second special report on infant mortality was published in 1911, and a third in 1912. These reports were available when our visitors were in Toronto.

In considering infant mortality in Canada, there is one reason that should be mentioned why, all over Canada, the infant mortality rate appears higher than it really is. Here it is in the words of those who know best.

Dr. George G. Melvin, D.P.H., Medical Health Officer for the city of St. John, New Brunswick, says: "There is good reason to believe that many births have not been recorded. The foregoing nominal rates, therefore, are almost certainly too high, and I particularly request, in case of publication, that a note be appended to this effect."

We have not only good reason to believe that a large proportion of our births in Toronto are not registered, we have actual proof of it. In 1911, Mr. R. E. Mills, B.A., Fellow in the Political Science Department of the University of Toronto, transcribed from the baptismal registers of five large churches

in Toronto all the births from January, 1908, to November, 1908, inclusive, being 375 births in all, and searched for the same in the alphabetical birth register in the office of the City Clerk of Toronto. Only 268 or 71·5 per cent. were found. This would show that probably only about 75 per cent. of our births are registered at all. Since no burial permit is issued without proper registration of the death, this correction of our vital statistics would make a difference to the infant mortality rate. A correction should also be made for still births, which should not be counted either as births or as deaths.

In the year 1908, for example, the infant mortality rate of Toronto is officially given as 193·4.

Corrected for stillbirths it is 155·5.

Corrected further for incomplete registration, it is 116·6.

Besides, to quote Dr. T. H. Whitelaw, the Medical Health Officer of Edmonton: "We are endeavouring to get our vital statistics as accurate as possible, but with the heterogeneous population we have here, including people from all parts of the world, it is questionable whether we get all.

"No words of mine could bring before you the difficulties we have upon us in our enormous non-English speaking immigration."

Our world in Canada is a *New World*. In the "Power House of the Line," sanitary laws and the collection of vital statistics are so much better understood and carried out than with us.

Our pioneers found a vast forest and there they hewed out homes for themselves. It was in the home of the God-fearing, loyal, hard-working pioneer that the Dominion of Canada was made, and on these homes, now of the second and third and fourth generation, the hopes of the Dominion of Canada rest to-day. The pioneers laid the foundations truly, but they had their hard times.

I have often heard my grandmother tell about meeting a bear just beyond her nearest neighbour's gate. She had her own baby with her. I do not suppose she was on her way to register that baby's birth, but she might have been. And it was not she, but the bear, that turned back. Bears were more numerous than birth registers in my grandmother's time.

Three or four years ago there died in London, Canada, Sir John Carling, Senator of the Dominion of Canada, at one time a member of her Government, and a Canadian who helped in his day and generation to make Canada. Not long before his death there died an old tree, older than he was, and that tree had a place in the history of his family. When Sir John Carling's father and mother were married, there was no registrar to record the marriage, nor church wherein to proclaim the banns, nor clergyman to perform the ceremony. The Justice of the Peace alone was there to marry them, and the banns were written by him and published by being affixed to that tree, standing by the roadside where the city of London, Canada, now stands.

In that same city of London, towards evening on June 23, 1913, the Canadian Medical Association assembled for our annual meeting. That day was the hundredth anniversary of a walk which belongs to Canadian history. Towards evening on June 23, 1813, Laura Secord milked her restless cow with remarkable skill and began that wonderful walk over which, in other and happier times, we, American and British alike, can smile.

At that meeting, a hundred years after, we had a discussion on Public Health Legislation by doctors from Halifax on the Atlantic, to Victoria on the Pacific. Among other topics discussed was: How to quarantine effectively for infectious disease.

Dr. Wilson, of Regina, told us that in Saskatchewan

if a rancher has sickness on the ranch and is not sure whether it is infectious or not, he has to placard these facts on his house himself. "That's the way we do things in the Prairie Provinces," said Dr. Wilson.

The pioneer is still to the fore as he was a century ago, but he has moved out to the Last Great West, where the rancher placards himself for contagious disease, and the Royal North-West Mounted Police help him.

"What do they know of England who only England know?"

But these considerations, which show you that in Canada infant mortality is not as high as it seems, and that there are some difficulties surrounding our birth registration, do not change the fact that our infant mortality is too high. We must, and will, do better, and we are beginning to try.

Take Montreal.—The death rate in Montreal under five years of age is said to be something like 40 or 50 per cent. But then is there any other large city represented here where there are families of nineteen children? Last year Montreal made a noble effort. She told the truth to herself. She organized a magnificent Child Welfare Exhibition in the Great Drill Hall. Everybody helped, from Professor Adami and Lady Drummond down to the newsboys. And this is the truth that Montreal told to herself at the first step inside the Hall:

"The Voice of the Child cries out against you. Last year 5,355 babies died in Montreal. Two-thirds of these deaths were preventable. What will you do to stop this waste of life?"

It was a great Child Welfare Exhibition, and will have an effect in reducing infant mortality. The French Canadian mother is like a Madonna. She is a wonderful mother, and she and her husband were deeply interested in the Child Welfare Exhibition.

Take Ottawa.—The infant mortality of Ottawa in

1908 was 256. What has been said about correction for stillbirths and for incomplete registration, and about French-Canadian families of thirteen to nineteen children, and about institution mortality applies especially to Ottawa and Montreal. There is another thing. Infant mortality is largely an institutional mortality, many babies not born in Ottawa at all go to swell that terrible death-rate.

The institution for the baby is a failure. Nature will have none of it. Her plan (except in the case of twins!) is "One baby one mother." The institution baby does not live. Put the baby in an institution and soon there is no baby. No Baby, No Nation.

In New York City, in 1911, 42 per cent. of all deaths under one year of age occurred in institutions.

Take Woodstock, Ontario.—There is a general impression that we have no aristocracy in Canada. This is a mistake. We have two orders of aristocracy. One order is known to history as the United Empire Loyalists; the other order was founded by the British Army officers who, serving in Canada, became Canadians, and settled in some of the most fertile parts of Ontario. They knew the value of vital statistics. Besides, in Woodstock we have a health officer who does not, when you write and ask him about infant mortality, reply that you will find the figures in the Government Report, but writes you a four-page letter, and then writes another four-page letter within four weeks, giving another year's records just issued, without being asked. Here he gives the exact numbers, tells precisely about the stillbirths, and writes a line for each dead baby, stating the exact cause of death, and whether or not the baby was nursed at the mother's breast, and which were illegitimate and which were twins, and everything else one can think of. That is the kind of health officer who has in his district the lowest infant mortality in Canada—in 1909, 73·4 per 1,000 births. (It

is not quite so good in 1911.) I think you will recognize his name as English—Dr. Ruttan.

Take Fort William, already referred to. Dr. Wodehouse, now Permanent District Health Officer, then Medical Health Officer at Fort William, attended to his primary duties. He got two sanitary by-laws passed in 1910. Then he got everybody to help him, including the Mayor of Fort William, who gave a banquet on June 7, 1911, to "Save the Baby." As you remember, in July and August, 1911, only twenty-one babies died, as compared with sixty-three in 1910.

Hamilton is another city where there does not seem to be a "complete lack of any thinking about the problem." For the last two or three years they have had a Babies' Dispensary Guild, with doctors and nurses to do the work and a Board largely composed of business men. Last year the Guild had a great newspaper and city campaign, which brought them about 15,000 dollars to save the babies of Hamilton. In 1912 they had 452 babies under their care, and only eighteen of these died.

Toronto is also thinking, though our visitors did not notice it. Housing is being seriously considered, and we are just finishing our first block of houses for working men, built by the Toronto Housing Company. Our Medical Health Officer, Dr. Charles Hastings, has employed several child welfare nurses, and pure milk depots have been established, especially in connection with the Settlements. Nor is the Church idle. In Earls court, alias Shacktown, for example, into one congregation about 280 babies were born in 1911 and only 6 died in the year. At a baby show, April 27, 1912, held by this church to encourage the study of health, 140 babies were shown, and of that number 139 were alive in November, 1912. This church employs a trained nurse to instruct and encourage the mothers

Our people are asking for information on this important subject. The Chief Health Officer of Ontario, Dr. J. W. S. McCullough, sent out in 1912 a small pamphlet entitled "A Little Talk about the Baby." Forty thousand have been issued. Five hundred copies were requested for the Child Welfare Exhibition in Montreal. The Manitoba Government asked permission to reprint it in full, and they have also sent it out by the thousand, and the eagerness with which the people took it showed how ready they were to learn. As one woman said, "Could I have a copy for my daughter, please? I would like her to have one in case she were to get married."

Infant mortality in Canada is still too high. But, on February 20, 1913, Dr. C. J. Fagan, Secretary of the Provincial Board of Health, and his deputy, Dr. Bapty, could report officially for the year ending December 31, 1912, to the Hon. Dr. Young, Provincial Secretary of the British Columbia Government:

"It is safe to say that, had the delinquent parents been compelled to register, the total births for 1912 would have amounted to 9,500 instead of 8,008, and the rate of deaths for 1,000 births would have been changed from 91 to 77. And in Nova Scotia for the year October 1, 1911, to September 30, 1912, the infant mortality rate was 102 per 1,000 births.

Every province in Canada will now set before itself the standard already reached by Nova Scotia on the Atlantic and British Columbia on the Pacific:—

Infant mortality, 100 or less per 1,000 births. As soon as we have reached that, then we must standardize again at:—

Infant mortality, 50 or less per 1,000 births. Do we think imperially? Do not let the thought of the city crowd out the thought of the settler, the farmer, and the pioneer. Post offices are needed in new districts, but not more needed than some succour

for the Canadian mother on the prairie, on the Peace River, or on the outposts anywhere. Wherever we need a post office, if there are homes and families, we must get a doctor, or a cottage hospital, or at least a district nurse, to welcome the Canadian baby and preserve that most precious life—the life of the mother.

THE PREVENTION OF INFANT MORTALITY.

By JAMES GRAY.

Secretary of the State Children's Council of South Australia.

THE State Children's Council of South Australia has directed that some information on the above subject shall be sent to the assembly gathering in London to discuss this topic.

This Council and its officers are much occupied with the work of preventing the death of infants who but for the Council's efforts would certainly die before a year old, and in endeavouring to bring such children up to maturity in such a degree of health, bodily, mental and moral, as shall make them useful people.

Since the State Children's Council took over the care of 666 children on January 1, 1887, the death-rate has been very low. The children were of all ages, wards of the State, and placed in most instances in the homes of various persons all over the country.

The following table goes to show that children placed in homes with adequate inspection are to a considerable degree protected as compared with those who are either in institutions or in uninspected homes, for it is to be noticed that during the last two or three years of the above record there was a difficulty in finding homes for infants, and an immediate rise in the death-rate followed consequent on their compulsory detention in institutions, although these were managed by the Council with every care.

		Of all ages to 18 years	Death- rate		
In 1887	out of 666 children	...	(1) ...	died.	
1888	" 800	"	(7) ...	6	"
1889	" 855	"	(4) ...	4	"
1890	" 867	"	(6) ...	6	"
1891	" 919	"	(8) ...	8	" 3 of whom were infants.
1892	" 996	"	(11) ...	11	" 8
1893	" 1,075	"	(7) ...	8	" 3
1894	" 1,115	"	(15) ...	17	" 7
1895	" 1,124	"	(4) ...	5	" 2
1896	" 1,122	"	(8) ...	9	" 5
1897	" 1,177	"	(8) ...	10	" 5
1898	" 1,210	"	(12) ...	15	" 4
1899	" 1,123	"	(6) ...	8	" 6
1900	" 1,248	"	(6) ...	8	" 5
1901	" 1,321	"	(11) ...	14	" 7
1902	" 1,321	"	(7) ...	10	" 7
1903	" 1,355	"	(7) ...	10	" 9
1904	" 1,338	"	(9) ...	13	" 7
1905	" 1,260	"	(7) ...	9	" 6
1906	" 1,269	"	(5) ...	7	" 5
1907	" 1,289	"	(6) ...	8	" 2
1908	" 1,336	"	(5) ...	8	" 3
1909	" 1,383	"	(7) ...	11	" 9
1910	" 1,479	"	(6) ...	10	" 6
1911	" 1,505	"	(11) ...	18	" 13
1912	" 1,530	"	(12) ...	19	" 16

There is, however, a yet more striking record in this case as in the above; the figures for the early years are not so complete as one would now wish; they are appended.

On January 1, 1896, the Council took charge of those called "licensed foster-mothers," when sixty-eight women had charge (during the year) of ninety-six infants, eighty of whom were illegitimate; fifteen died, or 15.6 per cent.

In 1897 there were 115 women, 148 infants, of whom 28 died, 18.9 per cent.

1898	" 118	" 175	"	34	" 19.4	"
1899	" 106	" 154	"	31	" 20.1	"
1900	" 145	" 178	"	24	" 13.5	"
1901	" 151	" 205	"	17	" 8.0	"
1902	" 134	" 183	"	9	" 4.7	"
1903	" 113	" 183	"	18	" 9.8	"
1904	" 129	" 148	"	15	" 10.1	"
1905	" 149	" 139	"	10	" 7.2	"
1906	" 143	" 131	"	17	" 13.0	"
1907	" 125	" 131	"	6	" 4.6	"
1908	" 131	" 146	"	9	" 6.1	"
1909	" 131	" 151	"	11	" 7.2	"

Licensed and Unlicensed.

In 1910 there were	477 women,	527 infants,	of whom	14	died, 2'6 %
1911	"	690	"	1,018	" " " 13 L. and
					5 Ul.=18 " 1'7 "
1912	"	730	"	1,370	" " 22 L. and
					22 Ul.=44 " 3'2 "

It will be seen that although there is an average of more than one in a family that the numbers in one home are small, and usually only one child in one home. Some of those nursing the children are single women of unblemished reputation, and some are widows, but many are married women with families of their own, whose hearts are large enough to admit the stranger's child and to let it share in the love of the home; such women are the most successful nurses.

The great increase in numbers in 1910-11-12 was caused by the Legislature of South Australia laying upon this Department in 1910, the duty of supervising *all* illegitimate children under 7 years, no matter with whom they might be living, and any children illegitimate or legitimate who might be in the care of persons not their parents whether for gain or reward or not. It will be seen that the death-rate is still low, and when it is remembered that before this action was taken it was shown that the death-rate of unsupervised illegitimate children was 45 per cent., as against from 4 per cent. to 5 per cent. of those supervised, the lowness of the present rate is marked, and has been secured by increased inspection and care.

It is further to be borne in mind that as yet the system is scarcely fairly at work; the time of the officers has been much occupied hitherto in finding children who were neglected, and in endeavouring to improve the homes in which they were found. So far no prosecutions for disregard of instructions have become necessary, but it is to be feared that as parents become accustomed to the system, the first shock

of discovery, and the first impulse to improvement lose their force, such prosecutions will become necessary. The Act gives the Department considerable power, but experience teaches that it is not wise to use power with any degree of harshness. As flagrant cases of disregard of instructions arise, legal proceedings will have to be taken. In the appendices¹ hereto will be found the regulations, the feeding instructions, &c., which are the ground of the work undertaken in connection with child saving by this Department.

One of the reasons for work along these lines is that it prevents to a great degree the need of relieving the mothers of their children, and the consequent building up of a large class of dependent or pauper children. It would seem that it must be for every reason a much better thing to enforce upon parents the duty of attending properly to their children, than to relieve them of that duty, for if anything can cause love for their offspring it is the doing of loving and kindly acts, and if the duty does not become a pleasure as it frequently does, then at least it is a duty done, and if at the point of the bayonet, still done, if considered as a penalty still a good thing. In order to make this part of the work as complete as possible, the Department traces the fathers as well as the mothers, and compels them to pay towards maintenance. The law here has been so altered as to be considerably in advance of other places in this respect.

For example, no corroboration of the woman's testimony is required unless, and until, the defendant has on his oath denied her allegations and has been cross-examined. Anyone familiar with affiliation cases will see that such provision is a great alteration

¹ These may be consulted at the Offices of the Association, 4, Tavistock Square, London, W.C.

and improvement. Then the excuse that some other person or persons may be the child's father is robbed of its efficiency as a defence in as much as the other man, or men, are required to testify that they are possibly the father before the statement has any weight, and by so doing they render themselves jointly and severally liable to contribute towards all expenses without exonerating the man charged. There is also power to take action before the birth of the child, and to secure beforehand the confinement expenses, and an order for maintenance. These powers are exercised by this Department gratis on the application of any poor person, who through poverty or ignorance may be unable to themselves appeal to the law. These provisions are found of great assistance in the way of preventing the neglect, consequent disease, and death of infants.

All these things, however, fail to touch the real fundamental cause of the difficulty. What should really be aimed at is not only the cure of diseased infants, the saving of weaklings to grow up feeble and ailing, to be weak-minded, to be morally weak, to be all their lives a burden to their fellow creatures, but to secure for our nation a stream of healthy well-nurtured (before as well as after birth), beloved and valued infants who will grow up to become stalwart men and bonny women, long lived, robust in body and mind, virtuous, clean living, vigorous and patriotic. We want to do away with the kind of infant who is lowering the vitality of our community and making us nationally weak; and breed the kind who will make our nation strong, brave, self-reliant, clear-headed, kind-hearted, patient, and (shall it be said?) "God like." To save infants of any kind at any cost *may* be politic, although there is much room for doubt, but to have infants who are *worth* saving is quite another matter, and one about which there can be no doubt. Can this be achieved? Not without effort; and

effort that is not usually made, appreciated, or tasteful. It is comparatively easy to devise means to avert the evil that arises from our misdeeds, but to cease to do evil is another matter and yet that is the way of deliverance. We may patch up the weakling, but he is still a weakling, But to become ourselves—brave, strong and virtuous, to ourselves be what we want our progeny to be ; to teach the nation to be a self-denying, continent, free from sexual vices ; to teach the rich to be ready to sacrifice personal ease and comfort, idleness and dissipation, in order to bring up larger families of goodly children, to teach the middle classes that to ape the rich and neglect their own health and their own families is folly as well as wickedness ; to so deal with the poor and ignorant as to enable them to live and to bring up healthy children ; to teach them how to see that they in their folly do not neglect their parental duties ; to kindly and yet firmly do these these things is hard, and yet it is the only really effective way of “preventing infant mortality.”

It is all very well for a nation frightened at its own decay to say we will save the children, but no nation can raise or even hold its own by any means other than living the life that constitutes national honour, and leads to national prosperity. The beginning of this paper shows what is being done to stem the tide of decay in one corner of the Empire. What is being done is having some effect, but it is not making weaklings strong, although it no doubt saves many children who would otherwise die, and some of whom are worth saving. The last few sentences however, touch the real point. It remains to be seen if (as may it be) our nation shall rise to its privileges and with one voice declare “we will qualify ourselves to be the parents of children who will need only a fair chance to lead the world.”

In conclusion, it may be well to say that in South

Australia it has been found that the best preventions of infant mortality in the present circumstances are: Placing the children in homes, as far as possible one in each home. No institutional life for babies, especially when *not* in good health. Close supervision by qualified inspectors under an authority with ample powers in order to enforce the best attainable treatment of the children by mothers and other relatives. Breast feeding where possible, and if not, feeding according to wise regulations. Supervision continued until seven years of age. Assistance for mothers to secure payment from the fathers.

This paper and appendices are sent in the hope that they may be of some slight use to the Conference.

By direction of the State Children's Council of South Australia.

APPENDICES.

(These may be consulted at the Offices of the National Association for the Prevention of Infant Mortality, 4, Tavistock Square, London, W.C.)

"Interstate Congress of Workers," Adelaide: May, 1909.

Pamphlet "State Children's Council Administration."

"State Children Convention," Adelaide: November, 1907.

"Feeding Regulations, &c., in connection with Licensed and Unlicensed Foster-mothers."

"State Children in Australia: a History of Boarding out and its Developments," by Catherine Helen Spence.

Copies of "State Children Acts" from 1895-1910.

THE MEDICAL INSPECTION OF INFANTS AND CHILDREN UNDER SCHOOL AGE.

By DAVID FORSYTH, M.D., D.Sc., F.R.C.P.

Physician to the Evelina Hospital for Sick Children; Physician to Out-patients, Charing Cross Hospital.

A SIGNIFICANT fact bearing on the health of children, though hitherto hardly appreciated beside the more conspicuous facts relating to infant mortality, is now beginning to claim attention. I refer to the widespread physical deterioration that overtakes children during the first four or five years of life. This fact is well established by the medical inspection of elementary school children, the majority of whom prove to be physically unsound, most of their defects, moreover, being preventible. Clearly, therefore, it is to these earlier years before schooling begins that attention must be turned if this deterioration is to be averted. The conditions cannot be adequately met by postponing action until the children reach the minimum school age, by which time much suffering and not a little permanent damage will have been inflicted. What is needed is some form of medical supervision, together with facilities for remedial treatment, extending over the whole of the first lustrum.

But with this problem only now unfolding itself, little or nothing has been done as yet by way of a solution. True, there are infant consultations in many parts of the country, but these, owing their inception to the movement against infant mortality, are concerned only with infants under one year. Since, however, as will be seen below, it is not until the second year at earliest that the physical defects of the future school entrants show themselves in any

number, preventive measures limited to the first year are unlikely to have much influence in warding off these later troubles. In a word, a gap, at present unbridged, stretches from the first year, when the activities of the infant consultation come to an end, to the fifth, when the school medical inspection begins.

How, then, is the medical supervision of children under school age to be dealt with in present circumstances? Perhaps the most practical answer I can offer to this question is to submit for your consideration and discussion the plan adopted in this City of Westminster. Some two years ago the Westminster Health Society prepared a scheme for the medical supervision of these children, and in January, 1912, opened a Medical Inspection Centre for children under school age to serve the population in the north half of the City. The lines on which the Centre is conducted can be briefly summarized. With the co-operation of the Public Health Authorities, information is received of all births recorded under the Notification of Births Act, and, with the help of a staff of health visitors, the Society at once gets into touch with every family where a child is newly born. The mother, as soon as she is about again, is invited to the Centre with her baby, who, after being undressed and weighed, is medically examined. In most cases the child is found to be healthy, but, at the same time, the opportunity is taken to enquire closely into the conditions of its daily life, especially with regard to feeding, cleanliness and clothing; and the mother, if at fault in her methods, is advised or shown how to improve them. On the few occasions when an infant is physically defective, and the condition is remediable, arrangements are made for suitable treatment either by a medical practitioner, or at a hospital or dispensary; in some cases convalescent treatment is secured by the help of other agencies;

and in a few necessitous cases the supply of cow's milk is supplemented. Finally, each mother, before leaving after the first inspection, is invited to bring her child up again after an interval appropriate to the requirements of the case, for the doctor to see that everything is going satisfactorily, while, if any special advice has been given, the health visitor to the case, by paying calls at the home, ensures that this is not forgotten.

In addition to these new-born infants, the Centre secures the attendance of older children up to five years, the same plan being followed as before. In this way the attempt has been made from the outset to include the whole of the under-school-age population of the district. The essence of the scheme, however, is to keep every child under medical supervision from the time of its birth until the end of its fifth year, and then to hand it over, sound and healthy, to the school authorities, together with the medical record of the material facts in its life for the information of the school doctor.

This brief sketch will indicate the main features of the Inspection Centre. It should be added, however, that, though the medical examination is held weekly, no inconsiderable amount of work arising out of the last inspection and in preparation for the next has to be undertaken during the intervals. In this the Centre has been fortunate in the assistance of a small band of regular helpers, including Lady Horner, Mrs. Raymond Asquith and Miss Horn, together with several members of the Society's staff of visitors.

The results of the first year's work¹ are probably

¹ At the conclusion of the current year the returns will be supplemented by those of a second Centre on similar lines, which has been opened in the south half of the City.

of sufficient interest to warrant their inclusion in this paper. Altogether, 374 children have been examined, excluding re-inspections. Of these, 131 were under one year, 77 under two years, 83, 50 and 33 under three, four and five years respectively. The outstanding feature of an analysis of the medical record cards is the rapid rise in the tide of disease with each year of life. For, while the large majority of the children in the first period are found to be healthy, only a small minority come through to their fifth year without at least one physical defect of some kind or another. This is most strikingly seen in cases of dental caries, a condition which is, probably, responsible for more ill-health among children than any other. The increasing percentage of these cases in successive years is shown in the table below.¹ It should further be added that, as a rule, the more advanced the age, the more extensive was the disease. A very similar rise is seen both with enlarged tonsils and with adenoids, while the proportion of these cases in urgent need of surgical operation increases yearly, indicating, of course, the aggravation of the condition when left untreated. With rickets, on the other hand, the incidence reaches a maximum in the second year, thereafter rapidly declining; this disease therefore, so often the cause of lifelong deformity, has inflicted its damage long before school age.

Altogether, the 374 children presented 332 defects. In addition, the feeding in a large proportion of the cases in the earliest years required some modification, great or small, and in almost one-half the cases under one year needed revision in one way or another. The following table, showing the percentage of children

¹ These figures lead up very well to the statement by the Chief Medical Officer to the Board of Education (Annual Report, 1910, p. 166), that "not more than a few children out of every hundred . . . fail to bear evidence of past or present dental disease."

affected in each year, summarizes the incidence of the more important defects:—

	0 year		1 year		2 years		3 years		4 years	
Teeth *	...	—	...	2·6	...	18·1	...	34·0	...	63·6
Tonsils	...	—	...	7·8	...	16·9	...	24·0	...	26·9
Adenoids	...	1·5	...	10·4	...	22·9	...	38·0	...	33·3
Rickets	...	13·0	...	25·9	...	9·6	...	8·0	...	3·0
Diet modified	...	49·6	...	22·8	...	6·0	...	—	...	—

The practical conclusion from the point of view of prevention and curative treatment hardly needs stating. Suffice it to say that there is no reason to suppose that the children examined at the Centre differ materially from other children of their class, at any rate in urban areas, and it is highly probable that, as similar Inspection Centres are organized elsewhere, the results will be, in the main, similar to those in Westminster. In other words, large numbers of children, healthy in all respects at birth, become, within five years, the physically defective entrants whom the Education Authority is required, at no small cost, to restore, so far as possible, to their original state of health. Yet most of these cases are preventable, or, if taken in time, can be remedied more speedily, and therefore more cheaply, than if left until school age; by which time not a few will have received permanent damage, physical or mental. The problem of the defective child largely resolves itself into the problem of the under school age child, and seems hardly likely to be solved by any scheme short of a national one ensuring to all children regular medical supervision from birth to school age. And this, to be fully successful, must run side by side with educational measures for instructing the mothers themselves who, from ignorance far more than from wilful neglect or even from indigence, are unable to safeguard their children's health.

THE PROBLEM OF THE INSTITUTIONAL INFANT.

By HENRY L. K. SHAW, M.D.

Albany.

THE problem of the institutional infant is a most complex one and unfortunately it is no nearer solution than it was years ago. There are fifteen institutions in New York State devoted exclusively to the care of young infants. These institutions are required by law to be regularly inspected by the State Board of Charities, with which are filed all reports of admissions, deaths, and discharges. In 1902 there were 3,394 infants admitted to these institutions, of which number 1,148 died, and in 1912 4,130 were admitted and 1,871 died under one year of age. The mortality in ratio to the number of infants admitted has averaged 38 per cent. for the past ten years. The number of deaths among infants in institutions, therefore, has varied but little during the past ten years, while the general infant mortality in New York State has been materially reduced. For example, in the year 1904 the number of deaths under one year to 1,000 living births was 151, or $15\frac{1}{10}$ per cent., while in 1912 there were 108 deaths under one year to 1,000 living births, or a mortality of $10\frac{8}{10}$ per cent. Outside of institutions a greater number of infants' lives are being saved each year by improved methods of feeding and caring for babies and by the instruction of the mothers in matters of infant welfare. In the institutions for infants, where the construction, hygienic conditions, air space, milk supply, and trained oversight are vastly better than in the majority of homes, the mortality is approximately four times as great and does not show any signs of diminishing. A comparison of the number of deaths among the home babies and the institutional babies

is misleading and unfair. Infant mortality as generally accepted is the number of deaths under one year of age to one thousand living births. This definition is not applicable to institutions where the death-rate is computed by the ratio between the number of deaths and the number of infants admitted or under treatment. There is a further source of error in some reports, where the babies who survive more than one year are included each year in the total on which the mortality rate is reckoned, while the deaths are counted but once.

After considerable correspondence and study of institutional reports, the fact is undeniable that the statistics on the subject of infant mortality in institutions in the United States are extremely unsatisfactory. There is no uniformity in the published statistics and one cannot make any comparisons that are worthy of consideration.

Many of the infants brought to infant asylums or hospitals are in poor and feeble physical condition, and while many of the deaths no doubt are preventable, still a large proportion of them are inevitable.

A closer analysis of the institutions for infants in New York State shows that they can be divided into two distinct types—one an asylum which only provides hospital care for such babies as may be ill; the other an infants' hospital, established and maintained for the sole purpose of treating sick babies and discharging them when well. The first type of institution has been in existence for centuries and the mortality in them has always been high. The foundling, the illegitimate, the deserted, and the orphan baby form the majority of the inmates, and it is in the strict sense of the word "an asylum." The second type is the modern institution and is a babies' hospital. It is not a home for the homeless and deserted baby, but a hospital for those in actual need of medical or surgical treatment.

There is an increasing tendency to find foster-mothers to nurse and to care for babies of the asylum type. The mother of the illegitimate child should be compelled to keep and to nurse her own baby and mother and infant should never be separated except for urgent and compelling reasons. When necessary, pensions should be granted by the municipality to the mother rather than to pay the board of the baby in an institution. This is successfully accomplished in several European cities. The following extract from the 1912 Report of the New York State Board of Charities is worthy of attention in this connection: "It is a short-sighted policy that authorizes the payment to private charitable institutions of from two to three dollars a week for each child of a good mother, when that sum or in some cases even less would have enabled such mother to maintain her home and to keep her family together. This is especially true in cases where, on the death or incapacity of a father, three or more children have been committed to institutions at public expense, and the mother left to make her own living. The result of this policy is to break up the family ties and in many cases to expend a larger sum of money for the maintenance of the children in institutions than would have been necessary to aid the mother in maintaining her family in her home for what would probably be a shorter period."

We of the new world cannot look back through the centuries to trace the evolution in the institutional care of infants, still we can point with some degree of pride to the following rule adopted by the Common Council of the City of New York in 1800: "Care should be taken to provide health and proper (wet) nurses for such of the infants as may require them, and where this can be done outside of the almshouse it shall be preferred." The records show that there were 129 infants placed out "at nurse" and paid for

by the State at the rate of one dollar a week. Some years later infants' asylums were established, and as the infant mortality grew to alarming and distressing proportions, the placing out system again came into favour.

The New York Foundling Asylum is one of several institutions in that city which makes a practice of placing out the babies in homes where the mothers can nurse them. In the year 1912 384 babies under one year of age were boarded out by this asylum and of this number 308 were wet-nursed and seventy-six bottle-fed. These foster-mothers and their homes are regularly inspected by physicians and nurses from the asylum and the mothers receive ten dollars a month for the care of each baby. If a baby becomes ill, it is returned to the asylum, and of 170 sick children so returned there were ninety-three deaths last year and nine deaths in the homes of the foster-parents. If the mortality of this asylum were computed on the number of deaths and the number of infants in the institution, it would be entirely misleading and a gross injustice to the institution.

Institutions for infants are necessary, but let us avoid the term asylum and all that it implies and use in preference that of homes or infant hospitals.

Every baby under one year of age requires individual care, nursing, and attention to diet and is almost as much care as the sick baby and should be considered a hospital case. To illustrate, I would like to describe the evolution of an institution with which I have the honour of being connected in Albany, New York, a city of about 100,000 inhabitants.

This institution was started as a foundling hospital in 1883, and was called St. Margaret's House. A study of over 2,500 infants which have been received since the institution was established shows that less than 2 per cent. were foundlings, but that the number of illegitimate babies outnumbered the legitimate by more

than two to one. The mortality as compared with the admissions from 1883 to 1901 showed that it ranged from 36 to 81 per cent. with an average of 38 per cent. In 1901 this institution was changed into a babies' hospital and the name incorporated as St. Margaret's House and Hospital for Infants. During this period there has been a marked increase in the number of sick babies sent by their parents for active medical treatment, and notwithstanding the fact that sick babies were admitted, the mortality has ranged from 10 to 25 per cent. with an average of 16 per cent. This lessened mortality has been coincident with placing the institution on a hospital basis, closer medical and nursing care of the babies, and the establishment of a training school for nursery maids. Under this arrangement there is one nurse to care for every four babies, which ensures more individual care and personal attention to the babies. These nursemaids become very fond of their little charges and the babies receive a certain amount of affection and care, which is best expressed by the term "mothering," and this is encouraged.

Dr. Holt, in his Presidential address last year before the American Association for the Study and Prevention of Infant Mortality, laid great emphasis on the educational value of the babies' hospital. He pointed out the fact that these hospitals do much more for the community than care for the sick poor. They instruct the medical profession and offer exceptional opportunity for the study and prevention of disease in infants. Nurses and nursery maids are given first-hand knowledge of many things relating to the care and feeding of infants, so that they can more intelligently impart this knowledge to ignorant mothers.

The solution to the problem of the institutional infant is to do away with the so-called infant asylums. The foundling and motherless baby should be provided with a suitable home with wet-nursing, and the mother and her infant should never be separated.

Infants' hospitals should be established in every community to provide for the babies requiring medical and surgical care. Such babies do much better and are more intelligently cared for in hospitals designed and adapted for the care of young infants. The babies' ward in the general hospital or in a children's hospital is not so productive of good results.

DISCUSSION.

Dr. S. G. MOORE (Huddersfield) said that only the previous week was issued from the Local Government Board the Second Report on Infant and Child Mortality in England and Wales by the Medical Officer of the Board. That Report covered the ground completely, and it dealt with the subject in a thoroughly satisfactory and masterly manner. What he (Dr. Moore) intended originally to deal with was the present position of infant mortality and death notification in this country, and that was the same thing as had been done in the Local Government Board's Report. Perhaps it would have been well if he had simply announced that his paper would not be given, but there were just two things to which he would like to refer briefly. The second page of the Report to which he had referred contained the following statements: "It is well known that after a long series of years, during which no appreciable sustained improvement occurred, a great decline in infant mortality has been experienced in recent years. The amount of saving of life that has been secured may be judged by the following illustration. In the seven years from 1906 to 1912 736,682 infants under 1 year died in England and Wales, the average annual death-rate being 115 per 1,000 births. Had the infantile death-rate been 144 per 1,000 births, the average rate for the seven years from 1899 to 1905, then 922,454 infants would have died in the seven years from 1906 to 1912. The improved conditions have implied a saving of 185,772 lives of infants during these seven years." He thought that those figures could hardly have too much importance given to them, and in the Report it was set forth, as it was in Dr. Newsholme's former Report, that that improvement must be ascribed at least in part to the work which had been undertaken directly with a view to securing that object. The other point to which he wished to refer was that in any organized effort to secure amelioration of the conditions affecting newly-born infants

it would be well if one thing was secured before others, namely, that in the community where the work was being carried on every child born should be dealt with, and that all the births should be taken into account. It was quite true that the heaviest mortality occurred in the poorer districts and in those parts of the district, whether it be a town or a rural district, where the conditions of life were least enviable; and it followed from that that it would suffice if the work which was set in hand dealt primarily with the children born in those places, but he ventured to think that greater good would result eventually if no distinction were made and if all the children born were visited. They had found as a result of what they had done in Huddersfield that the assistance of the Public Health Department was not only welcomed among all classes of the community, but it was a fact that they received complaints from time to time where they had not visited in the homes of the well-to-do classes as well as in the homes of the poorer people. He did not think it was necessary that he should attempt to describe in detail the conditions of such a field of work. He thought it quite obvious that it was well to try to increase that sentiment. He hoped the inference would not be made that he attached too little importance to the isolated works of consultations, schools for mothers, and all the other multifarious efforts which were put forward. He was quite sure that all of those things tended in the proper direction, and that they all did a large amount of good.

Sir WILLIAM THOMPSON (Registrar-General, Ireland) said: In dealing with this important subject, it will be at once conceded that a large death-rate of children under 1 year of age means a great amount of sickness amongst the population under 1 year, from which we infer that a certain proportion at least are able to attain and exceed the age of 1 year, but are necessarily weak and deteriorated in health. This is what all who work in this important section want to avoid. On the other hand, a low death-rate means less sickness and consequently healthier children.

Although the general death-rate and the death-rate from tuberculosis are higher in Ireland than in England or Scotland, still we can boast that our death-rate of children under 1 year is lower than in either of these countries, and is amongst those countries whose death-rate is specially low. To put this matter forward concisely, I have made out two statements, the first showing the number of deaths of male and female infants under 1 year of age per 1,000 of the births of males and females respectively, registered in Ireland during the decennial periods 1871-1880, 1881-1890,

1891-1900, and 1901-1910, and during the years 1911 and 1912.

INFANT MORTALITY, IRELAND.

Periods	Males	Females	Both sexes
1871-1880 ...	104	89	97
1881-1890 ...	102	86	95
1891-1900 ...	112	95	104
1901-1910 ...	104	87	96
1911 ...	101	86	94
1912 ...	97	76	86

From these figures it will be seen that in all the periods the death-rate of males has been higher than that of females. Also that the male death-rate has been over 100 excepting in last year, whereas the female death-rate for the same periods only on one occasion exceeded 90. It is also seen that the rate for both sexes fell from 97 per 1,000 during the period 1871-1880 to 95 in 1881-1890, and then went up considerably in the next period (1891-1900), viz., to 104, having fallen to 96 in the period 1901-1910. In the year 1911 the infant mortality was 94, and fell last year to 86, the lowest recorded rate since registration of deaths was introduced in 1864.

The next statement deals with the urban districts, the Dublin registration area, and Belfast city, showing the number of deaths of infants under 1 year of age per 1,000 births registered during the decennial periods 1881-1890, 1891-1900, 1901-1910, and the years 1911 and 1912.

Infant mortality—Rate per 1,000 births.

Periods	Urban districts	Dublin registration area	Belfast City
1881-1890 ...	147	175	151
1891-1900 ...	156	172	160
1901-1910 ...	133	152	144
1911 ...	129	156	128
1912 ...	120	140	129

NOTE.—The figures here given relate to the areas as constituted in the respective periods.

These figures are, I regret to say, high. They show that the highest death-rate for the urban districts and Belfast city was for the period 1891-1900, and from that period to the present there has been a steady decline; last year being the lowest on record for the urban districts and for Belfast with the exception of that for 1911, the rate for which was one less than that recorded for 1912.

In the case of the Dublin registration area the highest rate for any of the decennial periods was in 1881-1890, namely, 175, falling slightly to 172 in 1891-1900; in the period 1901-10 the rate was 152, in 1911 it was 156, falling

to 140 in 1912, a decrease which, although the mortality is still high, may be regarded as satisfactory.

It may be here mentioned that among the population of Ireland, exclusive of the urban districts already referred to, in the period 1901-10 the infant mortality rate was 74 per 1,000 births, in 1911 the rate was 73, falling to 67 in the year 1912.

Causes of death					0—3 months	3—6 months	6—12 months	Total under one year
All causes	...	...	...	...	51'44	14'48	20'46	86'38
Common infective diseases	Small-pox	...	...	...	—	—	—	—
	Measles	...	...	...	0'04	0'16	1'74	1'94
	Scarlet fever	...	...	...	0'02	—	0'06	0'08
	Whooping-cough	...	...	...	1'36	1'09	2'09	4'54
	Diphtheria, croup	...	...	...	0'14	0'14	0'36	0'64
	Influenza	...	...	...	0'20	0'14	0'16	0'50
	Chicken-pox	...	...	...	0'01	0'02	—	0'03
Tuberculous diseases	Diarrhoeal diseases	...	...	...	3'88	2'55	2'52	8'95
	Gastritis	...	...	...	0'10	0'31	0'51	10'92
	Tuberculous meningitis	...	...	...	0'07	0'22	0'29	0'58
	Tuberculous peritonitis, tabes mesenterica, and other ab- dominal tuberculoses	...	...	...	0'20	0'29	0'48	0'97
Wasting diseases	Other tuberculous diseases	...	...	...	27'44	2'51	1'57	31'52
	Premature birth, congenital mal- formations, want of breast milk, atrophy, debility, marasmus	...	...	...	0'40	0'15	0'08	0'63
	Syphilis	...	...	...	2'20	1'52	3'69	7'41
	Pneumonia	...	...	...	0'09	0'01	—	0'10
	Erysipelas	...	...	...	0'02	0'03	0'07	0'12
	Rickets	...	...	...	0'55	—	—	0'55
	Injury at birth	...	...	...	0'20	0'24	0'54	0'98
	Meningitis (not tuberculous) and encephalitis	...	...	...	6'84	1'43	1'50	9'77
	Convulsions	...	...	...	0'03	0'08	0'15	0'26
	Laryngitis	...	...	...	3'98	2'63	3'03	9'64
	Bronchitis	...	...	...	0'38	0'15	0'03	0'56
	Absorption of deleterious gases	...	...	...	3'29	0'81	1'59	5'69
	Other causes	...	...	...	

It may be of interest to record that in two counties, namely, Roscommon and Leitrim, the infant mortality per 1,000 births was 37 and 47 respectively in the year 1912.

As showing the contributory causes of the mortality rate I have included in this paper a table, and the remarks thereon, taken from my Forty-ninth Annual Report, 1912, which shows for Ireland the mortality by certain causes among infants under 12 months old per 1,000 births regis-

tered in the year 1912, distinguishing between those under 3 months old, 3 months old and under 6, and 6 months and under 12.

It appears from the foregoing table that the mortality rate of infants under 3 months old was 51·44 per 1,000 births registered; at 3 months of age and under 6 months it was 14·48 per 1,000; and between the ages of 6 months and 1 year it was 20·46 per 1,000 of all births registered.

It will be observed that of the principal causes of infant mortality more than one-third is attributed to a group—wasting diseases—which includes deaths from prematurity, congenital malformations, want of breast-milk, and *atrophy*, *debility*, and *marasmus*. Diarrhoea and intestinal complaints cause an infant mortality rate of 8·95 per 1,000 registered as compared with 20·02 in the preceding year; convulsions accounts for 9·77 deaths, bronchitis for 9·64, and pneumonia for 7·41 per 1,000 births registered. Among the common infective diseases whooping-cough is the most fatal, causing 4·54 deaths, and measles comes next, causing 1·94 deaths per 1,000 births registered. The infant mortality attributable to all forms of tuberculous disease is 2·47 per 1,000 of all births registered in Ireland during the year 1912, as compared with 3·00 in the year 1911.

The explanation of the low rate in rural districts is that a very large proportion of the mothers nurse their own babies. This is the ideal which we are working for, and when carried into effect we know the results are good. Such knowledge is, therefore, a stimulus for all workers interested in the welfare of infants to continue their efforts and try, as much as possible, to induce mothers to follow what Nature has always intended, viz., to feed babies by the breast.

The COUNTESS OF ABERDEEN said she had been asked to open the discussion, and she must make an apology if she did not say all she would like to, as she had only been called upon at very short notice. She would like especially to allude to the first paper read that afternoon by Mrs. Kitson Clark on the work of voluntary health societies in Great Britain, in order to supplement it by a little information in regard to the same kind of work which was being carried on in Ireland, and especially in the cities, where Sir William Thompson had already shown the death-rate was naturally so much higher than in the country districts. In Ireland they were called babies' welcomes, and the infant consultations babies' clubs. They were first started in Belfast, and the whole idea of these institutions was very much on the same lines as were organizations for the care of mothers

and infants elsewhere. The babies were supposed to join—it was understood that they brought their mothers. (Laughter.) They had the privilege of membership till they were a year old. The doctor met them every week. There was a nurse attached to nearly all the clubs. There were now some sixteen of them in Ireland in different parts of the country, and out of those clubs came all sorts of agencies like little mothers' classes, and playgrounds for little children, and instruction for mothers in the management of the home, and so on. The clubs were greatly valued wherever they had been started. It had been a common experience that these arrangements were greatly welcomed by the mothers, who had shown themselves most keen to receive advice, to attend health classes, and to carry out the instructions which they received there. As the point had been raised as to whether it was desirable that this sort of organization should be wholly under an official authority or whether it should be voluntary, she wished to say that she very much agreed with Mrs. Kitson Clark that it would be a very great mistake if they were ever to come altogether under the charge of the official authorities, however splendid they might be. Of course, the more co-ordination there was, the better, on the same lines as those carried out by Dr. Chalmers in Glasgow. In Dublin, in addition to babies' clubs, they had the City Infant Mortality Committee acting in connection with the Notification of Births Act, and both co-operated with the same end in view. Very much the same conditions existed in Ireland as had been shown by Mrs. Kitson Clark to exist in England and Wales.

Councillor ARTHUR RITSON (Sunderland) said they had had several speakers who seemed to look to the State almost entirely in connection with this work, and they had had other speakers who had spoken for voluntary effort. He thought the great thing to do was to get the work combined. The State had done a good deal and in Sunderland they were trying to find how to combine what the State had authorized them to do and had given them the means of doing with the voluntary workers who were willing to help them. He was very much struck with Mrs. Kitson Clark's address, that she did not wish to be put under the municipality or to be made into a State department. In Sunderland he did not say they had got a state of perfection, but he believed they were working on right lines. They had a resident medical officer of health; they had three lady visitors; they had notification of births—which they had as a voluntary act three years before the country

took it up. They used to pay 1s. for their notifications, and there was a feeling that when they ceased to pay that 1s. they would lose the notifications, but he was pleased to say that the people had continued to make use of the Notification Act and they seemed to wish to let them know that they had got babies. (Laughter.) After the lady health visitors had visited the mothers with newly born children, when they were no longer able to go on with their visits, the cases were handed over to the voluntary workers. The voluntary workers did a splendid service to these mothers and their children and their work among them was thoroughly appreciated. He recently got rather a shock in connection with that voluntary work. He might tell them that his wife acted entirely on her own responsibility in many matters—(laughter)—and among others in this work of looking after the children. Recently he was looking in a book in which she kept her accounts and he saw the rather puzzling entry "milk for my baby." (Laughter.) That was rather alarming, because their children were grown up and yet there was the entry "milk for my baby." (Renewed laughter.) However, all was well, for it turned out to be milk for a baby which his wife had adopted in this way—it seemed that in addition to visiting these children many of the ladies undertook to see that the babies got what was necessary in the way of milk and other food. It was not done in the way of charity; it was a friendly visit, and the child got as it were a second mother. They could easily see the advantage of that to the children of the poor, and it was astonishing how the mothers wanted to share their responsibilities with these ladies. They were told that the parents would resent the visits of the ladies and that in fact there would be strong opposition on the part of the people. They were also told that the people would not be interfered with, but nothing of the kind had happened. The mothers were delighted, and if the lady health visitor forgot to call or did not come frequently, sometimes they sent a message—"What about my baby?" His point was that voluntary work could be done in combination with municipal work and done very effectively indeed. The health visitors came to understand that one of the great difficulties poor mothers had in rearing their children was the way in which they fed them. They found that children in Sunderland were fed upon anything that was going. He heard of one child that was fed on radishes and tea. Of course it died, and the mother said it was Providence. (Laughter.) He did not know whether they agreed that radishes and tea was Providence—he should

say it was ignorance. (Laughter.) The people were quite willing to be taught and he hoped that to-day they had no children in Sunderland who were being fed on radishes and tea. As the lady visitors got amongst them they were extremely pleased to be visited and were glad to take the advice given them. Of course, there were some mothers who knew better than anybody else, and who would go on killing their children through ignorance, but they hoped eventually to stamp that sort of feeling out. His advice to the Conference was that they should do what they could with the machinery which they had, all of which could be readily established. He quite agreed that they should not send giddy young girls to visit these mothers—girls who did not know anything at all—but there must be hundreds of mothers with leisure who, although they had no baby of their own, had a mother's heart and who would be only too pleased to help in this work amongst the babies of the poor.

Mrs. J. KINGSWELL (Portsmouth) said she had listened with great interest to the very excellent papers which they had had, but she was afraid she was going to strike a little note of discord. She hoped she would not offend anyone, but she felt very strongly in regard to one or two aspects of the question which had not been referred to. They had heard a good deal said in the discussion about the decrease of infant mortality in all parts of the world. She had been thinking to herself—was that a matter to them for congratulation or not? She agreed with the splendid address of Mr. Burns on almost every point, but there was one little point in which she did not agree with him, and that was when he said he was not a member of the "better dead" school. She would rather put it, the "better not have been born" school. Some two or three years ago, or perhaps a little longer than that, Mrs. Sydney Webb and other ladies were touring the country speaking of the infantile mortality under the guardians. She (Mrs. Kingswell) was at a drawing-room meeting on one occasion, and a lady said it was a very shocking thing to know that there were 40 per cent. of the children who died under guardians in institutions. She (the speaker) asked leave to say a few words at the meeting, and she said would that lady be surprised to hear that she wished that 100 per cent. of the children under the guardians would die! She (Mrs. Kingswell) was a guardian and she wanted to say that the children born under their charge, or nearly every one that was born, was born in disease; nearly every one had something most terrible the matter with them, and the little children in their infirmary were rocking themselves to and

fro because of the sins of their parents. What she would like to know, speaking of the decrease in infant mortality, was whether the decrease was in regard to children of the unfit or children of the fit. If the decrease was in children of the fit no one would rejoice more than she would, but if it was in children of the unfit, she wished there could be some means found whereby those children could never be born. A gentleman had spoken of the devotion of the poor mothers. She entirely agreed with him if the children were of sound mind, but if not she said again it was better that those children should not be born. She was extremely glad to hear that morning Mr. Burns say that the Mental Deficiency Bill had passed. She wanted to tell them that in Portsmouth, when she was first a guardian, they held a committee on the subject, calling the whole of the women in the house before them, and time after time they found that women had been in and out of the workhouse for five, ten and twenty years, having five, ten, and perhaps more children. When she was in Winchester some time ago she went into the workhouse there and got into conversation with the matron about mental deficiency, and the matron said to her, "There's a woman there who has just come in going to have her fifth child. She has never done a day's work in her life; she is too silly to attend to herself at all." The matron then said, "I will show you the father," and she showed her a man in the male side of the ward, and she added that neither of them had ever done a day's work in their lives. Some little time ago she (Mrs. Kingswell) was in Southampton, and she saw the same thing there. A lady guardian pointed out a woman to her who was too foolish to attend to her own wants, who, she said, was likely to have perhaps another eight or ten or more children. About a year or a year and a half ago she was in Brighton at a conference on the feeble-minded, and there a gentleman stated that a philanthropic society had followed up 1,000 of these feeble-minded children. At 16 years of age they were sent out to do the best they could. He told them that after the first year so many had gone under, the second year so many more, and more again in the third year, and that in the fourth year there was not one of them who was engaged in good and remunerative employment. Statistics told them that men were perhaps more feeble-minded than women, and that led to a danger of another sort. Those people were filling our prisons and the maternity wards of our infirmaries, and they were bearing children who in their turn would be more feeble-minded and more vicious than themselves. She only wished she could know that all the

good things they had heard that morning about the decrease in infant mortality was in the children of the fit. If that were so no one would rejoice more than herself, but she could not help saying that, in fact, they had no cause for rejoicing. She was sorry to go against the gentleman who had spoken, but if the Mental Deficiency Bill gave guardians and others powers so as to shut up these poor unfortunate people really for their own good as well as for the good of the community, then in a year or two's time she would be rejoiced to hear that the death-rate among children was going down.

Dr. S. G. MOSTYN (Darlington) said he had been very much interested in listening to Mrs. Kitson Clark's paper and her remarks on the relative advantages of expert work, by which he took her to mean trained work and the work of amateurs. He felt that there was plenty of room for the work of both classes. He would like to emphasize one point which was of great importance to those of them who were engaged in public work. They were supposed to be experts as medical officers of health on various subjects, but the field in which they worked was enlarging so greatly that they could not be experts in every point of detail. They were willing (and he was speaking, he was sure, not only for medical officers of health, but for all engaged in administrative work) and anxious to be taught by experts, they were willing to learn from them how the work should be done properly. They could not afford in their work to make mistakes. Consequently, the knowledge they had must be the best, but he would like to ask that all experts who gave their advice would take a little trouble to learn about the nature and character of the work that medical officers had to do. They had, above all things, to be sane and show common sense in their work. It did not much matter if they were cranks if people did not think them to be cranks, but if they were thought to be cranks it was a much more serious matter. They had to know so much about various branches of science. They found the dentist who seemed to think that the whole world revolved on the teeth, and if the teeth were all right everything else was all right. They did not seem to realize that they as administrative officers had to take up a position that was recognized by the community as being sane—they did not realize that they had to take an all-round view. With regard to amateur help he felt that at the head of every undertaking they wanted someone with good sound common sense and with a good wide outlook, not only to direct the work, but to put on the brake and to prevent too great an emphasis being laid on one particular subject.

Councillor P. BUCK (Tottenham) said he had listened with very great interest to the paper by Mrs. Kitson Clark and had been very much struck with the views she had put before them regarding the voluntary movement. He could not help thinking while she was speaking of the maxim in the Old Book, which said "Bear ye one another's burdens," and another, "For every man shall bear his own burden." The two went together very largely, and it had struck him that, after all, while it was their duty to look after weakly members of the body politic, it was also the duty of individuals to some extent to look after themselves. Allusion had been made to voluntary work among mothers by various voluntary agencies, and he would like to tell them what they did in Tottenham. He had already mentioned the poverty in their district, and he was sorry to say that they had very little voluntary help. At times they had issued appeals for voluntary assistance and the result had been absolutely nothing, but, notwithstanding that, they had gone on with their work. They had two very good lady sanitary inspectors and three skilled nurses. They dealt with affections of the eyes; their lady health officer, who devoted her entire time to the schools, was an excellent woman, and diseases of the eye were dealt with. The teeth were about to be seen to in a dental clinic which was about to be established; adenoids had for a long time been dealt with, and they were also doing some feeding of the children; in fact, the Feeding Act was in operation during almost the whole of the year. In addition to that their lady medical officer had recently established a school for mothers, and he believed that already it was beginning to do very good work. It struck him, when Mrs. Kitson Clark was speaking about voluntary help, what a pity it was that they did not have visits in their poorer districts from some of the lady volunteers who were more ready to assist just the few poor in their own parishes and districts. In Tottenham they had a large hospital and they had the very best medical service, and those who knew what the medical profession did in the case of hospitals would realize what it was a visiting medical staff was able to do in a poor district like theirs. He could not help feeling what a good thing it would be if some of the well-to-do ladies outside his district would come down amongst them and see from time to time what was going on and give them a little of their financial assistance and possibly of their advice. There was just one point he would like to mention with regard to the ignorance of mothers. They all knew how appalling the ignorance of mothers was on some questions. Perhaps some of them had heard the

story of the mother who gave her child beefsteak or radishes and tea (he was not sure which), and who, when remonstrated with, said, "I ought to know. It is my child; I have buried eight," and so she thought she ought to know. (Laughter.) They did not want the mothers to bury any of them. Local authorities' work should be educative. He was greatly interested in listening to their friends from overseas, and hearing what they had to tell them. With regard to what Miss MacMurchy had told them, he was very pleased to hear how things were going on in Canada. He only hoped and believed that the figures of infant mortality in that country which she had given them were excessive, and no doubt by their children's welfare system they would be able to find out exactly where they were. One was almost tempted to say, on hearing Miss MacMurchy, that this played-out old country was not so bad after all. As he said, they welcomed their friends from overseas, and he was pleased they were able to compare notes one with another, for he was sure that their Colonial and other friends could teach them some things they would be glad to know.

Mr. B. TURNER (Dewsbury) said that to a large extent he agreed with some of the papers and he disagreed with the conclusions of many of the speeches that had been made since the papers were given. There seemed to be hanging around the Conference an atmosphere of patronage of the working classes—men and women—and, in his view, that patronage was not for the welfare of the State as a whole. God never meant that the child of any parent should pass away for want of medical attention. As long as sustenance was at the command of those who had money and not at the command of those who had not, so long would they have children dying at an early age; so long would they have weakly mothers, who could not bear children as successfully as those could who were blessed with a share of this world's goods. As long as there were three million women workers whose average wages ran down from 12s. per week, so long were they bound to have a large body of children dying the first year or the first five years of their existence, and therefore it might be well to get deeper down than the medical side of the question. He did not disregard the medical side of the question in any way, but they must see if they could not make the prospective mothers and fathers of the future generation fitted to have children in the proper way. When Mr. Burns that morning said something about "cleanly bred," he (the speaker) absolutely agreed with him. It was not often that he agreed

with Mr. Burns—(laughter)—but he did that morning; but the question was: How could they get at the parents of the prospective children? They had a few thousand schools, many thousands of schoolmasters and schoolmistresses, and millions of scholars, and it seemed to him that if only they could keep the girls at school until they were 16, and the boys until they were 15, and that while they were under their care the schoolmasters should teach the boys something about parentage and the schoolmistresses should teach the girls something about motherhood—it seemed to him that in that way they would do a far greater amount of good than they could possibly do by occasional visits in the mothers' homes. Whilst he was thankful for that Conference, he wanted to see if they could not go a little further than some of them wished. Their lady friend had talked about the Mental Deficiency Bill. That was a sprat that would not catch a whale—it would not catch anything. It would do nothing to stop the making of mental deficients by the canker worm of worry. It was worry among the poor that brought about mental strain, and brought forth weaklings, and therefore society would have to build, not upon the god of gold, but on the god of goodness before they would see any great change for the better in the conditions of infant mortality.

Mr. DOUGLAS EYRE (Social Welfare Association for London) said that at the Conference they were welcoming representatives from various parts of the Empire, but they had not heard so far of what was going on in London itself. He would like to speak specially in connection with the first paper read that afternoon—the place of the voluntary health worker in connection with infants. He could not conceive, neither did he think that any social worker in London could conceive, the ground being covered without the voluntary health worker. They had formed a Central Health Committee for London, and London, they must remember, was composed of twenty-eight huge centres of population gathered together under twenty-eight municipalities. The first thing they wanted was facts, and they had therefore prepared, after careful investigation, a report, which was now in the hands of the Local Government Board. They found that of the twenty-eight medical officers of health all welcomed the aid that could be given by voluntary health workers. We were an island nation, and our great weakness consisted in the insularity of our systems and of our policy. There were an enormous number of societies engaged in the same kind of philanthropic work, and the great need, not only in London, but, he believed, in every

great town in England, was for the co-ordination of effort and the prevention of overlapping. There were no less than sixteen central health societies in London alone, and in the case of twenty out of twenty-eight municipalities there was more than one voluntary health society at work. The first thing to be done was to co-ordinate the work of those various societies. But they wanted to do a great deal more. They wanted to arrange their work under expert guidance, and therefore they considered that all those voluntary health societies should be working in the various municipalities under the auspices and under the guidance of the medical officer of health, and they also felt very strongly indeed that the Public Health Authority should be actively engaged in associated effort with the voluntary agency. They would like to see in each of those great towns joint committees formed, consisting of representatives of the Public Health Authority and the Poor Relief Authority, because there were numbers and numbers of cases in which health work could not be done unless some real financial assistance was given to the cases. Then they would like to see the voluntary health societies assisted in the following ways: They all wanted a place in which to meet, and surely there could be no better place in which they could meet than in the municipal buildings themselves. Then they wanted a certain amount of financial assistance, because the most admirable voluntary health workers were not people who were able to give much financial assistance. Then they wanted, as it seemed to him, to form the joint committees to which he had referred. Briefly, what they wanted to effect in regard to the promotion of voluntary health work in this great metropolis was to get rid of insularity and to promote co-ordinated effort between the voluntary health agency and the officers.

Dr. TEMPLEMAN (Dundee) said he wished to say just one or two words on the same lines as the previous speaker. He came from a city which, unfortunately, had the reputation of having a very high infant mortality. He was sorry to say that Dundee had the highest infant mortality in Scotland, and although they had been endeavouring for a good many years past to reduce it, and had at work practically all the agencies which had been mentioned at the Conference, and had, in addition, *restaurants* for feeding the nursing and expectant mothers, they still found that their infant mortality did not come down with that certainty which they looked forward to and which they had hoped would have followed the measures they had taken. That, to his mind, was very largely due to the industrial condi-

tions which prevailed. Dundee was, unfortunately, a city of low wages. It was a city in which the male workers in the jute industry were paid low wages, and also it was a city in which they had an immense amount of women's labour, and when he told them that in Dundee they had fully 24 per cent. of their married women engaged in mills and factories earning wages ranging from about 12s. to 15s. a week, and very often the husbands earning no more, they could easily see that the economic conditions which existed in the city were important factors in their infantile mortality, and he had very great sympathy indeed with the previous speaker, who spoke with regard to the immense importance which economic conditions had in connection with the subject of infant mortality. He had no solution for the problem unfortunately, but he was quite convinced that with them in Dundee the poverty that followed upon low wages was a very important factor.

Dr. F. SHUFFLEBOTHAM (Staffordshire County Council) said he only desired to say a few words and to call special attention to the paper that had been read by Sir William Thompson. They could learn a very great deal from the statistics which he had placed before the Conference with regard to the conditions which prevailed in Ireland, from which they saw that infant mortality was considerably lower than it was in Great Britain, and Sir W. Thompson rightly pointed out the cause of that, viz., that the mothers in Ireland, speaking generally, suckled their own children, and it was for every member of that Conference to do everything in his or her power to encourage that method of feeding babes as far as they possibly could. Sir W. Thompson pointed out something else—he gave them the facts, but he drew no conclusion from it, and, with the permission of Sir William, he (Dr. Shufflebotham) would like to draw attention to the point. He told them that the figures regarding infant mortality in Ireland were lower than for the rest of Great Britain, and that marasmus, meaning atrophy and weakness, were the principal causes of infant mortality in that country. They could not overlook the fact that if marasmus (inherent weakness) was the principal cause of infant mortality, it simply showed that the mothers who were suckling their children were not having sufficient food, and he would impress upon those societies at the Conference who represented voluntary workers to pay special attention to that phase of the question. It seemed to him that if they had got the interests of the children at heart, that they must have the interest of these suckling mothers at heart as well;

and he asked them to show the same amount of interest in the mothers and to see that they had proper food. They had heard from Sunderland that there were ladies there providing the poor children with milk. He was firmly convinced that if only they could see to it that all mothers had sufficient food they would see that the principal cause of infant mortality, not only in Ireland, but also in England, would be materially reduced. The Medical Officer of Dundee had pointed out that one of the principal causes of infant mortality in this country was not only low wages, but also the employment of women in factories. He (Dr. Shufflebotham) came from the Pottery district, where, unfortunately, the infant mortality reached a very high figure, although at the present time it was better than it had been for some time, and undoubtedly there the principal cause of infant mortality was the inattention that was paid to the infants because the mothers were working at the factory. The children were not having sufficient food and they were not properly looked after. He sincerely hoped that the members of the Conference would remember what he had said as to the importance of the women who were suckling children having more food and being well looked after.

The COUNTESS OF ABERDEEN said that, speaking from what she knew in Ireland, it was most difficult to induce the poor mothers there to take proper nourishment. A great proportion of the women were very poor, but they would feed anybody else but themselves. They had made great efforts to try and bring this matter of feeding and the selection of foods which were most valuable before the people, but, as she had said, it was very difficult indeed to get the mothers themselves to take nourishment. Even in the cheap restaurants which they had been trying to introduce, where a dinner could be procured from a halfpenny to 4d., the mothers did not seem to benefit.

Miss T. McCoy (Portsmouth) said Dr. Moore and another speaker had told them that the babies born in their towns were visited and brought under the control of the Health Department. That was what they were trying to do in Portsmouth. Every baby that was born was seen by the medical officer of health, and he passed it on to the lady health visitor. She (Miss McCoy) went to see that lady the other day, and said, "Do you only visit the poor mothers?" and she replied, "Oh, no; I visit every mother, whether she be rich or poor." She also took a little book with her which had been drawn up by their medical officer, in which were given rules not only as to the feeding of children, but as to how the mother should

best fit herself so as to prepare for the ordeal and to feed her children after. The lady visitor took a copy of that little book to each of the mothers she visited, and it was left with them to think over. Their relieving officer also took a copy of the book to every woman who had charge of infants for fee or reward. They had the satisfaction of knowing that the book to which she was referring was in the hands of nearly every mother in Portsmouth, and that in consequence the people need not err through ignorance. She was glad to say that the mothers thoroughly appreciated the work of the health visitor, and they frequently brought their babies to the Town Hall to be examined by that lady, who took a great interest in all the children with whom she came into contact.

Alderman S. CRESSWELL (Wandsworth) said it was with some diffidence that he stood before the members of such an assembly of experts, but he wished to say a word on a subject that was more closely connected with infant mortality than any other subject, and which had not been referred to by any of the previous speakers—he referred to the complaint of measles. If there was one subject more than any other which they ought to consider in connection with that question it was that of measles, which was always more or less with them. It was a malady which was running right through the whole of the country. Professor Lawes, an eminent sanitary lecturer, had told them that they never had less than 200,000 cases in the year in Great Britain, and the same gentleman went on to point out that they had 10,000 deaths from that complaint alone in a year, and yet they went on year after year and seemed to take no notice of it whatever. He thought it was deplorable and lamentable in the extreme that they should let that great loss of infant life go on year after year. A previous speaker had spoken about the poor; it was the poor that lost their children more than any other class from measles, for they had no means of protecting them in their own homes, and the result was that the children of the poor were subjected to infection much more than those of the better classes. The poor were compelled to send their children to school in a district where there was an epidemic raging, and, provided the particular child had had the measles himself, the mothers laboured under the foolish fallacy that no child could have the disease more than once, and therefore they took no trouble to guard their children against infection. He thought it was wrong in the extreme to let that state of things go on year after year. They would ask him what was the remedy. He thought that the remedy

was one of which his friend from Sunderland would not approve. Councillor Ritson thought that the Government was doing too much, and he said he would not appeal to them to do anything more. He (Mr. Cresswell) would appeal to the Local Government Board to make something that was now only permissive compulsory. He would insist that every Public Health Committee should make measles compulsorily notifiable for a time, and then he believed they would very soon be able to stamp it out. Much had been done in other places. It was not merely the 10,000 deaths that they had to consider, but it was the lasting injury that was done to those who lived. The eye, the ear, and, more than anything else, the lungs were affected by the disease. If they looked down the death statistics they would find that there was almost always the same number of infantile deaths going on from bronchitis and pneumonia as from measles. If they got 13 deaths in a particular district from measles they would get from 11 to 14 from bronchitis or pneumonia, and let them remember that it was those diseases that laid the foundation for consumption. He was talking with one of the chief experts a short time ago, and that gentleman assured him that whatever amount of money the Government or anybody else spent in treating consumption they would never materially reduce it, or they would not reduce it as much as they ought to for the money spent until they began with the subject of measles, because measles impaired the lungs to such an extent that it was impossible for many children to avoid consumption when they came in contact with it in any shape or form. Those of them (and he believed it included everybody connected with the Conference) who took an interest in infant life would, he hoped, take an interest in that subject, and do what they could in their different localities to get measles compulsorily notifiable. It was most vital in the interests of the nation that they should get that disease stamped out. He would like to see some scientific medical research in regard to that disease, and if something of the sort were done, and they could get the health authorities to take up the subject and see whether some system could not be found of rendering children immune from such a dire disease, they would be doing something for their day and generation.

Dr. S. G. MOORE (Huddersfield), in replying, said he would like to say, *apropos* of the remarks of Alderman Cresswell, that measles, the prevalence and extent of which he deplored so very properly, was by no means escaping the attention of many medical officers of health, and he might tell Mr. Cresswell that the particular method of preventing

it which he first named—that of notification—had been tried in more than one district. His (Dr. Moore's) predecessor at Huddersfield secured the compulsory notification of measles there, and he devoted very special attention to an attempt to limit its ravages. That work was carried on for a number of years, but he regretted to say that the epidemics recurred with unabated virulence and in undiminished numbers. After a time the members of the Health Committee ordered an inquiry to attempt to show that no good results had accrued. At that time he (Dr. Moore) succeeded Dr. Annis, and he could give the Conference his sincere assurance that he examined the figures with the very greatest possible care, with the single view to show that some benefit in some direction had resulted from the time, trouble and expense which had been expended, but he was quite unable to do so, and in consequence of that the compulsory notification was abandoned. He would like to say a word with regard to Alderman Cresswell's suggestion that they should attempt to establish immunity. That was a far more hopeful way of dealing with the problem. If it were possible to discover a vaccine that would have that effect, he ventured to say that that would be one of the greatest benefits that could be conferred upon mankind, only comparable with the benefits which had resulted from inoculation against small-pox. The first difficulty was that they had not yet discovered the germ of the disease. They had reason to suppose that there was some germ, but it had not yet been discovered. He would like to add to the general discussion on infant mortality an expression of opinion at which he had arrived, namely, that the diminution of deaths among infants resulted rather indirectly than directly from their work. They did many things; they all knew what they were, but he would like to tell them what he had found as a result of his own experiences. They were told that the baby died, and that it was the will of God. It was sometimes said, "Poor little thing, it missed a lot of trouble, and it was better dead," and the death was regarded as inevitable. Happily, to-day public opinion had altogether changed. When a baby died now the neighbours—and public opinion counted for a great deal amongst them—felt that something had happened which ought not to have happened, and hence it was that the direct measures which were available were taken advantage of. He was in cordial agreement with the speakers, and notably with Mr. Turner, when they established the fact that infant mortality was a result of malnutrition. He was rather inclined to think that the same was true of tuberculosis. It was a fact that for the last fifty years of the past century

the deaths from tuberculosis fell by 50 per cent., and it was in that period that food became so abundant and so cheap as they knew it to have been. He thought that the two things went hand in hand, and they would find that some of the reduction in the general death-rate of the country resulted from the prosperity which we were happily enjoying. Might he suggest to the Countess of Aberdeen that perhaps it would be practicable to secure that the nourishment went direct to the nursing mother if it were furnished in the form of dried milk? They found in his town that dried milk was very useful. It was not a food which appealed to the people for some reason or another, but they knew that it was milk, and they would take it, and, of course, as they all knew, it was a perfect food. It had the additional advantage that from the nature of the process which it went through in the process of manufacture it was sterile and was free from all possibility of conveying disease, and as against the establishment of a depôt for modifying or humanizing milk it was very inexpensive. There was one subject in which he was particularly interested, and that was the aspect of the infant mortality problem which was referred to by Mrs. Kingswell. He recognized that perhaps he was biased in that matter. He took it that if a medical man wished to save life at all hazards and under all circumstances and by any means it was the unfortunate outcome of his training, and it might be the case that others were better able to judge as to the advisability or not of keeping alive unfortunate babies. On that point he would like to say that they might be sure that the very measures, whether they be direct sanitary measures or whether they be the wider social influences—the very measures which lessened the number of deaths at the same time invariably increased the strength and the resisting powers of the survivors. If they had fewer deaths, there would be fewer illnesses and less suffering. Although it might be the case that some babies were born to an inheritance of disease and misery, proportionately they were so few when they were counted out as a percentage of the total, that they might be ignored and left out of account altogether in the general subject of infant mortality.

Dr. C. Q. LENANE (Battersea) said he would not have intervened in the discussion but for the observations which had been made by Alderman Cresswell regarding measles. He came from a district which had been from time to time ravaged by measles, and every means that could be tried to deal with the disease from a preventive point of view had been attempted. The result was, however, that notwithstanding all those attempts they were just as badly off in

regard to the death-rate from the disease. He thought that when they were face to face with a problem like that, they had got to consider whether it was not wise to adopt the means by which they had been able in the past to control all other infectious diseases; and whether they should not adopt compulsory notification. Conferences had been held in London as to the best means by which measles could be grappled with, and the question of compulsory notification among others had been tried. Dr. Moore in his remarks referred to the attempt that was made in his own district to carry out compulsory notification, and he told them it had failed. He (Dr. Lenane) would refer Dr. Moore to the report of one of the medical officers of the Local Government Board, Dr. Thompson, who brought out a very elaborate report on that question some few years ago. Dr. Theodore Thompson in that report referred to attempts made by certain authorities in the country to carry out a system of compulsory notification, and he pointed out that in his opinion the reason such authorities did not succeed in the object which they had in view was not the fault of the compulsory notification itself, but the failure to carry out a very important point, and that was the proper isolation of such cases. It should be borne in mind that when carrying out compulsory notification proper treatment must always be provided, amongst the poorer classes more especially, and he did not believe that any attempt on their part to deal with the disease would be successful, unless they were prepared to provide adequate treatment for the children of the poorer classes who were suffering from measles. The death-rate in measles was essentially due to the fact that such children were not given the advantage of proper treatment at an early date. If proper treatment could be secured to them at an early date he had no doubt that along with compulsory notification and prompt removal of such cases to an isolation hospital a very large amount of the death-rate which they now had in their district from that disease would cease. There was another point which should be borne in mind, which was that they did not know to what extent the disease affected the death-rate of tuberculosis. They knew very well that a very large number of cases of tuberculosis followed upon measles, and he himself had no doubt that as a factor in the production of tuberculosis a great many cases indeed were the direct results of the neglect of treatment of those persons who survived an attack of measles. He therefore felt that the time had arrived when something should be done in providing an efficient compulsory system of notification,

provided that the other means to which he had referred as accompanying notification were carried out in the district.

Dr. T. J. CLARKE (Malay States) said that with regard to the point which had been raised as to the desirability of the compulsory notification of measles he had had some experience in the Tropics which might bear on the question. He had found that if notification were used to isolate and segregate the patients, and to keep the sick child apart from others, it was liable to lead to the concentration of a large number of sick in a small area or to the absence of fresh air in the homes. He believed that the proper treatment of measles was similar to the treatment given for phthisis. As they were all aware, it was not so many years ago that abundance of fresh air in cases of phthisis was looked upon as dangerous, but now they gave phthisical patients all the fresh air possible, and in his opinion if measles were treated on the open-air system there would be a much smaller death-rate, and that had been his experience. His point was that if they adopted notification in order to stamp out measles, do not let them put the patients in camps or tents or isolation hospitals, but give them plenty of fresh air.

The CHAIRMAN, in closing the meeting, said he thought he might thank all the various speakers for the very interesting and instructive discussion that had followed upon the reading of the papers. The discussion had not only shown them how much had been done, but it had also clearly demonstrated what an enormous amount still remained to be done. He did not think, however, that the outlook could be considered to be altogether hopeless, and he felt they were justified in believing that if progress were carried on steadily by the means which had been indicated at the Conference they might hope for some real amelioration of the terrible state of affairs and the terrible wastage of human life which was revealed by a study of infant mortality the whole world over.

The meeting then terminated.

THIRD SESSION, AUGUST 5.

HER EXCELLENCY THE COUNTESS OF ABERDEEN presided over the meeting on Tuesday, when the subject under discussion was "The Administrative Control of the Milk Supply."

In opening the proceedings Lady ABERDEEN said: In the few minutes which I wish to reserve to myself as Chairman I desire to draw your attention to the report which will shortly be issued of the first official Milk Commission

appointed in the United Kingdom. Its appointment came about in this way. The lecturers and organizers of the Women's National Health Association of Ireland who attended meetings, or who lectured in connection with our travelling Health and Tuberculosis Exhibitions, have always been careful to emphasize the importance of right food in building up the constitution to resist the onslaught of disease, and of course in particular the value of porridge and milk, as opposed to white bread and stewed tea, was insisted on. But as time went on the reports sent in by our staff as to the difficulty of obtaining milk at all in many parts of the country, especially during the winter, and the questionable purity of the supply in many cases, and of the manner of handling it, became more and more insistent. Our Association therefore approached the Lord Lieutenant with the petition for the appointment of a Viceregal Milk Commission, and the petition was granted with the hearty support of the Department of Agriculture and the Local Government Board. It is a very representative Commission, and very ably presided over by Mr. P. T. O'Neill, the Chairman of the General Council of County Councils in Ireland. It has travelled in every part of Ireland, has held fifty-six meetings, examined 281 witnesses, and has also taken evidence from Manchester, Liverpool, Birmingham, and Glasgow; and we understand it is now about to issue a unanimous report. I am not in a position to forecast the substance of that report, but I am authorized by the Chairman to make a few general remarks, and to bespeak your study of the report when it appears, as bearing upon a problem which is interesting the whole country, and which we earnestly hope Mr. John Burns's Milk Bill is to solve in large measure. The question of the scarcity of milk into which the Commission was directed to inquire was found to vary very much in different districts, still more the reasons for that scarcity. Strictly speaking there is no scarcity in the towns—but scarcity is created by poverty and consequent inability to obtain milk, by ignorance of the value of milk as a food, and by the difficulty of obtaining an uncontaminated supply. Evidence was given showing that in some districts children scarcely understood what milk was, and when taken to hospital had to be taught to drink it. The teapot stewing on the hearth has been too apt to supply the drink for the children returning from school, and in Ireland the custom has been for the children's school hours to continue from 9.30 to 3.30 with scarcely any drink. It is but lately that half an hour's break has been introduced, and in some districts cocoa and milk lunches provided. We have no Provision of School Meals

Act in Ireland. The Commission will dwell on the importance of local milk depôts, and will strongly recommend all doubt being cleared up as to the power of urban authorities in Ireland to maintain such depôts, the good results of the few voluntarily conducted milk depôts dispensing small quantities of reliable milk to poor customers having been proved. The question in the towns is shown to be largely a question of organization and of bringing the producer and consumer together. The rural problem is much more difficult, and the different causes for scarcity will be reviewed and explained, and various recommendations likely to remove or minimize these difficulties are made. The Commission refer to the importance of winter dairying, the keeping of milk records, the improvement of the milk yielding properties of cows, showing how this can with certainty be attained, and how little attention has been paid to the matter. We understand that the use of goats by small-holders and the improvement of the breed for milk-yielding properties is also brought forward. The second part of the report deals with the prevention of the contamination of milk. The stamping out of tuberculosis in cattle is dealt with at length, but the recently issued Tuberculosis Order for the slaughter of tuberculous cattle has gone a long way to carry out the recommendations made. The need of applying the provisions of the existing Dairies, Cowsheds and Milk Shops Order has engaged the attention of the Commission, and the recommendations they hope to make aim at establishing uniform and efficient administration by local authorities under the supervision of inspectors responsible to a central authority. The working out of this part of the question has been found very difficult. The many causes leading to the infection of milk, and thereby to the spread of infectious disease, are laid stress on, and recommendations are made for strengthening the laws relating to the detection and sale of infected milk, and to the precaution to be taken by all those connected with the handling of milk. Sterilization, pasteurization, and the use of dried milk are referred to, and the need of an educational campaign on all these points, as well as on the value of milk as a food, is insisted on. The Women's National Health Association are preparing to do their best to promote such a campaign as soon as the report appears during the autumn. Our branches all through the country hope to organize milk meetings, milk exhibits, milk lantern lectures, demonstration and cinematograph shows, and with the powerful aid of the press and of the interest of you, ladies and gentlemen, and of the public generally, we trust that the labours of this

Commission may be very fruitful in their results. (Applause.) I have a very pleasant surprise for you. In addition to the programme which we have before us this morning, we have with us here Dr. Herman Biggs, Medical Officer of New York. That does not at all convey what Dr. Biggs is, what his powers are, or what he has been able to do during his term of office. He is also medical officer to the Board of Health of New York and perhaps I may be allowed to explain that that Board of Health consists of three in whose hands lie very autocratic powers. The decrees of that Board of Health become effective in a fortnight without having to pass any legislative chamber, and Dr. Biggs is the medical officer of that Board. If you ask him what the decrees of the Board of Health have been regarding milk in New York and what the decrease of the death-rate has been in New York during the time he has held office, you will get a better idea who Dr. Herman Biggs is.

Dr. HERMAN BIGGS (New York) said he was glad to be present at the Conference and at the request of the Countess of Aberdeen to speak briefly on the system of the administrative control of the milk supply in New York City. About fifteen years ago, in order to control better the supply of milk, the Board of Health passed a series of regulations requiring permits for all milk establishments and for all vehicles importing milk. Those permits were renewed each year. It was a misdemeanour to sell milk without a permit of the Board. The permit could be revoked at any time at any meeting of the Board. Soon afterwards a system of milk inspection was established, beginning with the milk trains and steamboats, and finally with the collecting stations in the country, and also at the dairies. It would give them some idea of what the system of inspection must mean when he told them that the milk supply of New York now comprised about two million quarts a day derived from six or seven different States and coming in some instances as far as 400 miles. In the beginning they had a good deal of difficulty with the transshipment companies. They found that some of the worst milk coming into New York came from districts very near the city, in some instances only fifty or sixty miles from the city. All their milk was at least twenty-four hours old before it reached the city and most of it was thirty-six hours or more when it reached them. Of course, it therefore became necessary to use artificial means for refrigeration. Some of the milk which came short distances—forty or fifty miles—they found was put into cars in the afternoon of a hot summer's day when the temperature in the car was 73° or 80° or more; it

remained in the cars until the milk train came along in the early evening and reached New York at one or two o'clock in the morning. The temperature of the milk at that time was often 60° or 70°. The milk came to the grocery and other stores and they found that it contained enormous numbers of micro-organisms, in some instances as high as 200 and 300 millions per cubic centimetre. Orders were issued first of all to the transport companies requiring the refrigerating of the milk by icing or the use of refrigerating cars. Some of the companies refused to obey those orders, saying that it was not the function of the Board of Health to determine the conditions of transportation. The Board replied in substance that it might not be their function, but that it would insist that only milk which was fit for human consumption should be delivered into New York City, and they proceeded to reject several consignments of milk as they came in. As the carriers were responsible for this milk to the producers, that action had the required effect and immediately provisions were made by the transport companies for the refrigeration. Then the inspection of the collecting stations in the country was taken up and it was found that very bad conditions existed in many of these. In one instance, for example, it was found that a very large concern had its collecting station equipped with all possible facilities for the adulteration and sophistication of milk. It had colouring matter for cream, gelatine for thickening the cream, and formaldehyde preparations for preservation, and every facility for the production of adulterated milk. The milk in question was excluded at once from New York. The company was called upon to show cause why the permit for the sale of milk in New York should not be revoked, and after three weeks the permits of the company, which he might say was a very large one, were revoked and the company was put out of business. It had been in business in New York for twenty years and it immediately started a suit against the city for 50,000 dollars damages. That suit was carried on in the courts for several years and finally was discontinued and the action of the Board was sustained. The result of that was that when the inspectors of the Department of Health went to the collecting stations in the country and made suggestions to the proprietors in regard to changes and other matters, they were immediately complied with; in some instances the agents of the company wrote to the Department of Health even before the report of the inspector recommended the changes. He should say that the Department had no power really to go into the country,

but had exercised those powers by virtue of the control which it had on the sale of milk in New York. It said in substance to the companies, "If you do not permit us to inspect milk in the country you cannot sell it in New York." The question of dairy inspection was also taken up. There were about 40,000 dairy farms which sent milk to New York and they would realize that the inspection of those dairies was a very stupendous task. When they started they had fifty county inspectors. Of course, that number was totally inadequate to the proper inspection of such an enormous number of dairies scattered over a very large area, but as a result of their work a very great improvement in the character of the milk supply was brought about. About four or five years ago the Board began to feel doubtful as to the protection that was really afforded to the milk supply by their system of inspection, and it became doubtful first of all because of outbreaks of scarlet fever and diphtheria which occurred in the city of New York traced to the milk supply. They were never able definitely to trace the outbreak in New York City to the milk supply, but there were such outbreaks in the immediate vicinity of New York where infected milk was found. Then they had a number of outbreaks of typhoid fever and finally, four years ago, there was a very extensive outbreak of typhoid, which occurred on the east side of the city, in which nearly 300 cases were definitely traced to the milk. It was found that the milk in question came from the northern part of the State, about 350 miles from New York. The inspectors went to the collecting stations from which it had been shipped. They found that the conditions there were generally good, they examined every dairy that supplied that collecting station and could not find any case of typhoid fever. They then went into the town and found that there had been a great deal of typhoid fever there and they found that almost all the cases were from one milk. Inspectors went to the dairy where that particular milk came from and requested permission to make an examination of the dairyman and his family and employees. The permission was readily given and it was found that the dairyman himself was the carrier of the infection and microscopical examination revealed the fact that more than 60 per cent. of the organisms in the first cultures were typhoid bacillus. They found that the dairyman had had typhoid fever in 1864. He had been a dairyman in Camden City for many years, and they found that on looking up the history of Camden they had had typhoid fever there so continuously that it was not called typhoid fever, it was called

Camden fever. In order to ensure a safe supply of milk they had determined to gradually put into force a scheme for the pasteurization of the total milk supply of the city. With that in view the milk dealers were notified about two years ago that such a scheme would be put into force and last year it was put into effect. A new system of rules and regulations was adopted by which the milk was graded. Broadly speaking, there were three grades of milk: Grade A, which was intended for infant feeding; Grade B, which was food for adults, but not regarded as suitable for infant feeding; and Grade C, which was cooking milk. When a milk dealer in New York made an application for permits he made application to sell a certain grade of milk—Grade A, Grade B, or Grade C—and he stated where the dairies were from which his milk was to be derived. Those dairies were then inspected, they were grouped by grades, and the dairyman was then notified of the grade of milk he could sell, whether it was Grade A, Grade B, or Grade C. In Grade A was certified or guaranteed milk which was high-class milk. Certified milk in New York was only a very small quantity. It was very expensive, costing 15 to 25 cents a quart, and could be only used by people who were very well-to-do. Grade B milk was also pasteurized milk which was inspected and pasteurized. It cost only 9 or 10 cents a quart and was good quality milk. Grade B milk was intended for adults. The distinction was made because they found after a long study of tuberculosis that the danger of infection to adults by tuberculous milk was almost nothing. They studied 500 cases and the only cases of infection by bovine bacillus were found in young children. In young children they were found to be very common, but in no single one of nearly 400 cases of adult tuberculosis which were studied was bovine tuberculosis found, and as the application of the tuberculin test amongst the herds was a very expensive process and would increase the price of milk considerably, it was felt unwise to compel that for anything except the milk which was to be used for infants, therefore Grade B milk was not tested for tuberculin. Grade C milk was cooking milk. At the present time about half of the total milk supply of New York—about one million quarts—was pasteurized. In all those places where Grade C was sold there was a notice: "The only milk sold here is cooking milk," and that cooking milk was furnished in cans which were specially marked. It was hoped, within the next year or year and a half, that practically the whole supply of milk, excepting the guaran-

teed and certified milk and excepting the milk which was used for cooking and for commercial purposes, would be pasteurized. They were convinced that what he had set forth was the solution of the problem so far as New York City was concerned. The conditions in New York City were, of course, somewhat different from what they were in smaller communities where the milk was derived from a small area; but they felt convinced that under the conditions existing in New York it was only in the way he had described that a safe milk could be supplied.

THE ADMINISTRATIVE CONTROL OF THE MILK SUPPLY, WITH SPECIAL REFERENCE TO TUBERCULOSIS.

By J. M. BEATTIE, M.D.

Professor of Bacteriology in the University and Bacteriologist to the City of Liverpool.

So much evidence has now been accumulated as to the relation of a tuberculous milk supply to tuberculosis in children, that it is not necessary to give more than the merest outline of the statistical evidence in order to convince even the most sceptical of the importance and the gravity of the problem with which it is my privilege to deal at this Congress.

It is generally agreed that the tuberculous lesions which are due to the bovine bacillus are more particularly those situated in the cervical glands and in the intestines and mesenteric glands—the former infected by way of the tonsils and adenoids of the nose and pharynx, the latter by the direct ingestion of foods containing the bacillus of tuberculosis.

It is somewhat difficult to get accurate statistics on these points, but the following table of an analysis of 1,042 cases of tuberculosis in adults and in children by Park and his colleagues [1] is sufficient to show the importance of the bovine bacillus in producing human disease :—

BOVINE AND HUMAN TYPES OF TUBERCLE BACILLI.

Combined tabulation, cases reported and own series of cases.

Diagnosis	ADULTS 16 years and over			CHILDREN 5 to 16 years		CHILDREN under 5 years		
	Human	Bovine		Human	Bovine		Human	Bovine
Pulmonary tuberculosis	568	1(?)...		11	—	...	12	—
Tuberculous adenitis, axillary or inguinal ...	2	—	...	4	—	...	2	—
Tuberculous adenitis, cervical ...	22	1	...	33*	20	...	15	20
Abdominal tuberculosis	15	3	...	7	7	...	6	13
Generalized tuberculosis, alimentory origin ...	6	1	...	2	3	...	13	10
Generalized tuberculosis	28	—	...	4	1	...	28	5
Generalized tuberculosis, including meninges ; alimentory origin ...	—	—	...	1	—	...	3	8
Generalized tuberculosis, including meninges ...	4	—	...	7	—	...	45	1
Tubercular meningitis...	—	—	...	2	—	...	14	2
Tuberculosis of bones and joints ...	18	1	...	26	1	...	21	—
Genito-urinary tubercu- losis ...	11	1	...	1	—	...	—	—
Tuberculosis of skin ...	1	—	...	—	1	...	—	—

Miscellaneous cases:—

Tuberculosis of tonsils	—	—	...	—	1	...	—	—
Tuberculosis of mouth and cervical nodes ...	—	1	...	—	—	...	—	—
Tuberculous sinus or abscess ...	2	—	...	—	—	...	—	—
Sepsis ...	—	—	...	—	—	...	1	—

Totals ...	677	9	...	99	33	...	161	59
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From this table it will be seen that in children under 5 years of age—out of 59 cases due to the bovine bacillus—20 were cases of cervical adenitis, and 31 were probably of alimentary origin. In children

between the ages of 5 and 16—out of 33 cases—20 are classed as cervical adenitis and 10 were alimentary in origin. In adults only 9 cases out of 686 were due to the bovine bacillus, and of these 4 were alimentary in origin. This table also shows that in children at least one-third of the cases of tuberculosis were due to the bovine bacillus, whereas in adults only 1·3 per cent. can be traced to this type of organism. It may be claimed that some of the cases of cervical adenitis may have been infected by inhalation of the bacilli, but the large proportion due to the bovine bacillus certainly suggests infection of the tonsils and adenoid tissue by the accumulation in their crypts of food containing the bovine bacillus. The alimentary infection is undoubtedly due to the ingestion of infected food.

Boviard [2] in 1908, at the Sixth International Congress on Tuberculosis, reported the *post-mortem* evidence which had been collected in Great Britain in the course of almost twenty years, and this showed that 20·3 per cent. of all *fatal* cases of tuberculosis in children were in all probability infected through the alimentary canal, and presumably by food.

Again, in the final Report on the Royal Commission on Tuberculosis, we find that in 19 out of 24 cases, in one series in which the bovine type of bacillus was found, the primary lesions were connected with the alimentary canal, but we can go further, for, from this Report, it would appear that 22 per cent. of persons dying before the age of 15 years from tuberculosis of various organs were infected with the bovine bacillus, and of these cases 80 per cent. resulted from lesions in the alimentary canal.

Delépine [3] in a recent paper has made the following abstract from a most important research by Dr. John Fraser, which is based on an examination of cases of tuberculosis in bones and joints occurring

in the surgical practice of Mr. Stiles at the Hospital for Sick Children, Edinburgh :—

	Total number examined	Types of bacilli obtained from the lesions	Number of cases	Per centage
Children under 5 years ...	47	{ Human type	... 12	... —
		{ Human and bovine...	3	... —
		{ Bovine type	... 32	... 68
Children 5 to 12 years ...	20	{ Human type	... 11	... —
		{ Bovine type	... 9	... 45

Of the children under 5 there were 16 under 2 years of age, and the bovine bacillus was found in 12 of these, and it was ascertained that each of these children had been fed from the first on unsterilized cow's milk.

Much more evidence could be brought forward, but this I think sufficient to establish my first point, that food, and particularly milk containing *Bacilli tuberculosis*, is responsible not only for the deaths but for the disablement of a considerable number of infants and young children.

Let us now look at the preventive measures, which may be classed under two heads :

(1) The sterilization of all milk which is given to children.

(2) The energetic control of our milk supplies.

We may dismiss the first of these in a few words, for it would be the merest folly to try in any way to compel the sterilization of all milk which is sold, even if this were desirable, and so long as unsterilized milk can be bought, we can have no guarantee that children will not be fed upon it. We are an unscientific people and we object to compulsion in anything. We may preach sterilization from morning till night and from year's end to year's end, and the majority will remain obdurate to our preaching.

The second course is, therefore, the only one we need concern ourselves with. We have already made many advances. Our chief cities and many of our counties

have for long exercised a control over our milk supplies, and this has had the very desirable effect of reducing in a few years the amount of tuberculous milk sold by over 50 per cent. But this reduction should have been much greater, and I have no hesitation in asserting that in a comparatively few years tuberculosis could be eradicated from our milking herds if our control were thorough, general and compulsory, and not lax and sporadic as it now often is.

You will ask me then on what lines I advocate this thorough control. I may sum it up thus—the compulsory inspection of cows, cowsheds, dairies, &c., by competent inspectors under the control of skilled administrative officers and assisted by scientific observers who are skilled bacteriologists.

The cows should be inspected thoroughly and their udders examined, when empty, at least three times per year, and any animal which gives any indication of disease at once isolated. It should be compulsory on the dairyman who introduces a new cow into his herd to notify this fact to the administrative officer, so that the animal may be inspected at once. This universal and systematic examination of the cows would prevent a custom which is too prevalent to-day—the driving of tuberculous cattle from the controlled farms into neighbouring districts where the control is not effective. The bacteriological examination of the milk should be undertaken frequently, the mixed sample from any given dairy being the usual supply, but when the special inspection of the cows is being made then samples should be taken from any suspicious animals. If the mixed sample at any time shows the presence of *B. tuberculosis*, then that dairy should be visited, any suspicious animals isolated, samples taken from these as well as control samples from the rest of the herd, and these samples carefully examined bacteriologically. In this way the infected animals could be separated

and kept under observation. If they are proved to be tuberculous then they are slaughtered. If this strict inspection is carried out universally and systematically, we will soon have got rid of our tuberculous cattle. As to whether trained veterinary surgeons or skilled inspectors should be employed in this work, it is not my province to advise, but for the examination of the milk there can be no question that it should be wholly in the hands of expert bacteriologists, for this examination needs skill, training, and considerable experience.

The three main difficulties to be met with are :—

- (1) The presence of extremely few bacilli.
- (2) The presence of acid-fast bacilli which morphologically resemble *B. tuberculosis*.
- (3) The presence of "non-acid-fast" *B. tuberculosis*.

(1) When the bacilli are very scanty, and this is the common condition, it is necessary to centrifugalize considerable quantities of the milk (as a routine practice, I centrifugalize 1,000 c.c.), and this centrifugalization should be carried out from thirty to sixty minutes at a speed of from 2,000 to 3,000 revolutions per minute. The examination of the deposit must be done carefully and often for prolonged periods before any bacilli are found, and in many cases failure to find the organism after a prolonged search does not mean that they are absent. A negative result of a microscopical examination is of very doubtful value; though if the special cow from which the milk has been taken shows no signs of tuberculosis, the negative result may be interpreted favourably. But if inoculation into animals is discouraged, many cows infected with tuberculosis will escape detection.

(2) The presence of acid-fast bacilli which do not produce tuberculosis is common in many mixed samples. These are probably derived from extraneous sources and, where strict cleanliness is observed, they

are usually absent. Even to the expert bacteriologist, the difficulty of distinguishing them from *B. tuberculosis* by microscopical methods is very great, and in two samples which came under my observation quite recently it was quite impossible to do so.

(3) It has been clearly established by several observers that *B. tuberculosis* may be present and may produce tuberculosis, though it does not react to the regulation staining process. The microscope is useless for the discovery of these organisms.

These three difficulties, not to mention others, which present themselves to the expert bacteriologist prove how unsatisfactory it would be to allow this microscopical examination to be the sole test for tuberculous milk, and how disastrous it would be to place the examination in the hands of inexperienced individuals. The inoculation method if carried out properly guarantees that every sample of tuberculous milk will be discovered, and for the microscopical methods even its strongest advocates do not claim more than 90 per cent. of successes. In inexperienced hands the failures will undoubtedly amount to 40 or 50 per cent., and yet, in spite of these facts, we find that by the Tuberculosis Order, 1913, the Board of Agriculture has given power to the local authorities to accept microscopical examination by veterinary inspectors in suspected animals as sufficient examination to decree the slaughter.

I do not question the ability of some of these inspectors, but to give this general power is to my mind one of the most retrograde steps which has ever been taken in the tuberculosis campaign, and it will undoubtedly lead not merely to the slaughter of non-tuberculous animals—a fact that will tend to bring the whole process of inspection into disrepute—but, what is more serious, to the selling of undetected tuberculous milk with the false security that proper inspection and examination is being carried out.

Every bacteriologist of repute will agree with me when I say that administration can only be successful if based on complete and accurate diagnosis, that accurate diagnosis can only be obtained in many cases, especially in the early stages of the disease, by the discovery of *B. tuberculosis* in the milk, and that the only sure way to detect these bacilli is by the inoculation method. If this is the case, then it is, I think, obvious that any instruction which can be used as a means of utilizing microscopical examination as a substitute for the inoculation method, even if the microscopical examination were left in the hands of trained and expert bacteriologists, as it has not been by the Tuberculosis Order, is a retrograde step—in fact retrograde is a very mild term with which to characterize it. The only serious objection which has been brought against the inoculation method is the necessary delay in getting a final diagnosis—four to five weeks. During that time, however, in all those cases where suspicious bacilli are discovered by the microscope, the milk would not be used for ordinary purposes, for the suspected cow would be isolated and cared for by the Local Authority. Isolation at the dairy or farm of the owner of the cow would be very unsatisfactory, for there would always be the temptation to use the milk when the inspector was absent.

No sane person suggests that we should not isolate cases of scarlet fever or diphtheria, or that we should not provide at the public expense hospitals for such cases and sanatoria for consumptives; surely, then, it is not unreasonable to suggest the establishment of suitable hospitals, if you like so to designate them, where doubtfully infected cattle can be isolated and properly cared for until such time as a definite diagnosis is arrived at. If the animal turns out to be non-tuberculous, then the dairyman should be paid the value of the milk supply which he has

lost during those weeks of isolation, but if the animal proves tuberculous he has no claim other than he is allowed at present. If the bacilli are not discovered by microscopical methods the tuberculous milk supply may be continued indefinitely, or, at any rate, till the next periodic inspection if inoculation methods are dispensed with, whereas, at the worst, it can only be continued for a few weeks if inoculation methods are used.

The new Milk and Dairies Bill aims at the proper inspection of cattle, and in many of its features it is a decidedly progressive measure; but like so much of the present-day legislation, it only attacks the problem from one side. It does not make any provision for efficient veterinary inspection, for it is very obvious that many small local authorities cannot employ efficient full-time officers, and unless efficient inspection is carried on systematically over the whole country, the sources of difficulty which arise to-day as a result of unequal control will persist.

To sum up I would advocate :—

(1) That the systematic inspection of cattle should be placed in the hands of full-time veterinary inspectors, who are experienced in the diagnosis of tuberculosis in animals.

(2) That isolation farms should be established by Local Authorities where suspected animals may be kept until a positive or negative diagnosis is established.

(3) That the farmer or dairyman should be paid for the milk supply which he necessarily loses during the four or five weeks of isolation, if the cow is proved to be non-tuberculous.

(4) That the bacteriological and experimental testing of the milk and other secretions should be entrusted to experienced bacteriologists who have at their disposal laboratories in which all the best means of carrying out the examinations are available, and

that microscopical examination as a substitute for the inoculation method should be discouraged.

I fully realize that this scheme, of which I give the merest outline, will mean considerable expenditure, but it is an expenditure which will mean the eradication of tuberculosis from our cattle and the saving of at least 20 or 25 per cent. of our children. The majority of us grumble at the increased taxation for education, school medical attention, and a host of other things, but I am convinced that as a nation our grumbling does not mean very much when we really are convinced that our money is being spent to improve the health and general physique of our people, and we will even cease to grumble at the giving of money when we realize that it is being spent to save the lives of our children, and in some measure to banish from our homes that dread "white plague"—tuberculosis.

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THE SUPERVISION OF MILK SUPPLIES IN THE UNITED STATES, AND ITS BEARING ON THE PROTECTION OF THE PUBLIC HEALTH.

BY ASSISTANT SURGEON-GENERAL J. W. KERR.

United States Public Health Service.

MILK is in all probability more largely used in the United States than in any other country. It enters into the dietary of practically every inhabitant from infancy to old age. Because of the extent of its use, our milk supplies have been likened to vast rivers whose tributaries flow through thousands of miles of agricultural country, and empty finally into the great centres of population.

The average annual consumption of milk of urban populations in the United States is held to be about 23 gallons per person. Since the total of this class of the population in 1910 was 42,623,383, it requires about 980,000,000 gallons of milk to supply its needs annually. This enormous quantity by no means represents the total milk production, however, since it does not include that used by the farming population, and is exclusive of the supplies entering into the manufacture of butter and cheese. It does represent, however, those supplies, the production and handling of which constitute largely the milk problem, a problem which is among the most important of those affecting the public health.

HISTORY OF DEVELOPMENT.

Official Measures.—Probably the first official action in respect to milk taken in America was due to the occurrence of that highly fatal affection known as “milk sickness” early in the last century. Several of the States offered liberal rewards for the

discovery of the cause of the disease, and in 1821 Tennessee passed a law "to prevent animals from eating an unknown vegetable, thereby imparting to their milk and flesh qualities highly deleterious."

These were measures wholly in the interest of the public health, but when the country became cleared and settled the disease largely disappeared and they were no longer operative.

Many years passed without further milk legislation, but eventually the dilution and skimming of public supplies became so notorious as to give rise to additional laws. The first of these laws was enacted in Massachusetts in 1856, and later in many other States.

Although the original laws have mostly been amended or superseded by more extensive measures, their provisions to prohibit the sophistication of milk have been continued. The primary object, however, was to prevent fraud, and they were thus almost wholly of economic import. In fact their passage was brought about in some States at least by dairymen whose business was being jeopardized by unscrupulous competitors.

The chief official emphasis was placed on chemical analyses to detect evidences of dilution or skimming. A great amount of work was performed to perfect standards and methods of examination, and as a result some of them were incorporated in laws or regulations. The total solids required were variously fixed for whole milk at 12, 12.50 and 13 per cent., and the specific gravity at 1029. The 12 per cent. total solids for whole milk remains the standard of the Federal Government to-day. As a result of these measures, the practice of diluting milk, which had been general, was largely stopped.

Practically coincident with the beginning of the efforts to prevent adulteration of milk supplies was the movement to prevent the feeding of milk cows

on distillery slops and garbage. In New York this movement was begun in 1841 and continued until a State law was passed. By 1867 "the swill milk nuisance" had been practically abated in the city of New York, but it persisted to some extent for many years thereafter in other places, certainly up to 1907, when I saw distillery slop being fed to cows of a so-called certified dairy.

Frequently associated with "the swill milk nuisance" was the practice in large cities of keeping considerable numbers of cows constantly in overcrowded, badly-ventilated and poorly-lighted stables. This practice was undoubtedly encouraged by the availability of distillery waste and household slops, also by the lack of adequate transportation facilities prevailing forty years ago, and was responsible in part for beginning the appointment of milk inspectors who would control nuisances in cities where such conditions then existed.

There is little evidence, however, of any great activity on the part of States and municipalities to control milk supplies prior to 1880, and all legislation enacted had been aimed almost entirely at the prevention of the dilution and skimming of milk, the feeding of distillery wastes and the overcrowding of town cow stables. The first epoch in the history of milk control may be said, therefore, to have covered the quarter of a century prior to 1880, and related essentially to the prevention of fraud.

During all this time, however, the medical profession attributed the high infant mortality in cities in part at least to impoverished milk supplies. While the heat of summer was regarded generally as the great factor in the production of infant morbidity, the fact that the heat was practically as high in the adjoining country, where children did well, made it apparent that defective milk supplies were also a factor, and in the seventies the health officer of one

large city advocated the wholesale removal of children during summer to the country by the authorities as a means of reducing infant morbidity.

Other cities depended on chemical analyses and such inspections as existed to reduce the sickness due to milk. That these were not recognized as sufficient is shown by the following exclamation of a Philadelphia physician in 1878 :—¹

"Three inspectors to preserve the life, vitality, and nourishment of 150,000 children! Why, it will take a dozen capable inspectors to guard against the adulteration of milk—one of the greatest outrages of the day against our mild-mannered, long-suffering public."

The excessive infant mortality was also attracting the attention of health authorities on account of its increase in large cities, and their milk supplies were becoming more and more implicated. In addition to causing disease by reason of unwholesomeness and impoverishment, milk had been shown to be a carrier of disease.

In the Annual Report of the Massachusetts State Board of Health for 1871, evidence had been presented showing that foot and mouth disease was transmitted by drinking the milk of infected cows, and it was evidently suspected that other diseases could also be so contracted. In consequence there were gradually incorporated in laws and regulations provisions to prevent such occurrences. The first of these appears to have been aimed at the prevention of the diseases with which cows themselves might be afflicted.²

As time went on, evidence rapidly accumulated to show that other diseases could be so transmitted. In 1857, in Scotland, Taylor had observed an outbreak

¹ *Medical Record*, November 9, 1878, Editorial.

² A copy of the Michigan law of 1873 appears on p. 206 of the Annual Report of the State Board of Health for 1882.

of typhoid fever and traced the infection to milk.¹ Observations of like character were repeatedly made later in Great Britain, Hart having collected reports of no less than forty-three such outbreaks there prior to 1881.² In making these observations British health authorities and physicians were the pioneers, as they have been in so many other matters affecting the public health.

Like observations were first recorded in the United States in 1882,³ but the number was soon multiplied until there could be no doubt that a new problem in milk control had arisen—the economic aspects of milk production are becoming overshadowed by its public health aspects.

The next principle of milk control incorporated in law appears, therefore, to have been that aimed at preventing the transportation and sale of milk contaminated by “the emanations, exhalations or discharges of any person sick with communicable disease.” The development of this legislation and the determination of the facts on which it was based marked a second epoch in milk control which extended for a decade or more from 1880, and dealt with dangerous milk.

The practical application of bacteriology in the study of milk, and the discovery of the tubercle bacillus as the cause of tuberculosis, may be said to have marked the beginning of the third or present epoch in milk control in the United States—a period within which intermittent effort has been made in many sections against unsafe and insanitary milk supplies.

The milk statutes existing prior to 1890 were not intended to control bacterial contamination, that is

¹ Dr. R. M. Taylor, *Edinburgh Medical Journal*, May, 1858.

² Hart (E.), *British Medical Journal*, 1897, i, p. 1167.

³ *Hygienic Laboratory Bulletin*, No. 56, p. 26.

they did not authorize supervision over production and transportation of milk in order to insure its freedom from extraneous matter. In a few jurisdictions laws were soon passed, however, to prevent the sale of "diseased, corrupted or unwholesome milk," and in the State of New York by an Act of 1894 tuberculosis among cattle was investigated, and infected cows were destroyed, the owners being indemnified by the State. This was the first law of its kind in America, but similar provisions were soon adopted by other States, and in order to prevent the use of formaldehyde as a preservative additional laws rapidly followed.

Here and there laws and orders had been issued over a period of many years requiring particular measures that would tend to improve milk supplies. These measures were the precursor of the present system of milk control as practised generally in the United States; for instance, by a law of April 20, 1869, in Pennsylvania the councils of cities and boroughs were authorized to provide for inspections of milk; the sanitary code of 1875 of New York City provided for inspections of milk distributing establishments; by an Act of 1886 milk distributors in Massachusetts were required to take out licences; in 1889 in the same State the Board of Health recommended cooling of milk to 50°, and in 1893 cities in Massachusetts were required to appoint milk inspectors, towns being authorized to do so; in Minnesota and the District of Columbia in 1895 authority was granted local health authorities to protect their milk supplies by means of control of herds, inspections and licensing of dairies by the Health Officer of the District of Columbia being specifically authorized by the Congress of the United States. These latter laws were the first of this character under which municipal authorities were authorized to inspect dairies outside their jurisdiction,

penalty for refusal of inspection being the shutting out from the city of milk coming from such dairies.

Unofficial Measures.—As centres of population grew and became overcrowded, infant morbidity increased. In 1868 from one-fourth to one-half of the total deaths occurring in New York City were among children under one year of age. In an indefinite way such high mortality in different cities was attributed to milk. By 1890 there had been a slight relative decrease, but in the meantime health authorities and pediatricists had had impressed on them by long experience the dangers of contaminated milk as a cause of infant morbidity and mortality.

The then existing laws had not been aimed to prevent the sale of milk that was too old, too warm and too dirty. There thus arose the necessity of amending them, and in the meantime efforts were required which would place at the disposal of infants, at least, a safer milk supply. Accordingly, through private initiative two notable movements were started in 1889 and 1890, the first, by Koplik, having for its object the control and distribution of milk to infants of the poor; and the second, by Coit, the production of clean or "certified" milk for clinical purposes under the control of a medical milk commission.

In 1889 Koplik started an infants' milk depot in the Eastern Dispensary, New York, and like institutions were shortly opened by others in that city and other places.¹ In 1893 Coit was instrumental in organizing the first Medical Milk Commission in Essex County, New Jersey. These two achievements marked a new era in milk supervision in the United States. In the milk depot mentioned the milk was heated before dispensing, which is the practice in many such institutions to-day, one of these having in 1893 espoused the cause of pasteurization of

¹ *Hygienic Laboratory Bulletin*, No. 56, P.H.S., p. 629.

all milk, and consistently carried it on for twenty years.

The pure milk movement was a halting one for more than a decade, when it began to receive renewed attention, due to continued high infant mortality rates and to outbreaks of communicable diseases traced to milk. The excessive prevalence also of bovine tuberculosis had become better known through the activities of the Federal and State Governments. The Department of Agriculture had for years conducted investigations, and prepared and distributed tuberculin to dairymen for diagnostic purposes, and the dangerous but unsuspected tuberculous cow was thus being exposed. There was a growing appreciation that something had to be done.

In consequence, meetings were held here and there to consider sanitation of milk supplies, milk commissions were formed, infants' milk depots were opened, literature on milk was distributed, and milk shows were held in many places. People were beginning to rebel against dirty milk, and to inquire into the safety of raw milk, and this was being led by progressive health authorities and others interested.

Accordingly, many laws and ordinances were amended or new ones passed, and new requirements put in force. The inspection and scoring of herds and dairies became more general, systems of permits were adopted, and licensing of dairymen became the practice. The testing of milk for temperature and bacterial content was begun and extended.

Milk inspection beginning at the farm was inaugurated by the authorities of the District of Columbia in 1895, and during the same year the tuberculin test was inaugurated in a small way in the same jurisdiction. By 1903 in New York an ordinance required the cooling of milk to 50°, and during that year the city of Boston adopted a maximum bacterial standard of 500,000 per c.c. for milk sold in

that city. The principles had thus been outlined which should serve as a basis in future to improve milk supplies, and in 1907 these were collected by the United States Public Health Service; additional studies were made and all the data published in an exhaustive treatise which has become a classic on milk in its relation to the public health.

It would be impracticable to refer to the inception of all measures for the production of safe milk, or to mention their promoters, such, for instance, as the use of glass milk bottles by Morris in Philadelphia in 1878, the use of the vacuum apparatus by Francisco in 1910 to clean milk cows, the use of the beer pasteurizer by North in 1908 to pasteurize milk in bottles at the farm, and the reciprocal acceptance by cities such as Pittsburg and Cleveland of milk inspectors' reports. That they have all exerted an influence is evidenced by the present attitude in respect to the control of milk supplies.

PRESENT SYSTEMS OF SUPERVISION.

The milk problem in the United States is many-sided, and being approached from different angles by both voluntary and official agencies. For purposes of supervision, the best classification of milk is generally accepted to be (*a*) certified, (*b*) inspected, (*c*) pasteurized, and (*a*) cooking.

The production and handling of certified milk is supervised by voluntary medical milk commissions, of which there are now seventy-two organized in different parts of the country. The methods and standards are prescribed by the Association of Medical Milk Commissions, but certified milk is recognized also in the laws of several States, including New Jersey. The methods and standards under which certified milk is produced and distributed represent the ideals of dairy hygiene, the adoption of which the United States Public Health Service has encouraged

by publication and distribution of the methods and standards as prescribed from time to time.¹

Control of the other grades mentioned comes for the most part under official agencies, wherever exercised, and involves the inspection and scoring of dairies, the issue of permits to producers, the notification of cases of sickness on the farm, the licensing of milk distributors, the inspection of milk depots and milk shipments, and the routine examination of milk samples with respect to adulteration, temperature, bacterial counts, &c.

Both certified and inspected milk are properly the product of tuberculin-tested cows, but in the case of the latter tuberculin tests have in most places been impracticable of enforcement. In other respects there has been diversity of requirements and enforcement, and in order to encourage uniformity there was organized at the instance of the New York Milk Committee in 1911 a national volunteer commission, composed of eminent authorities on the milk question, which should formulate reasonable standards for adoption by public health authorities generally. The results of their work were published and widely distributed by the United States Public Health Service.² The Federal Government, through its bureau of animal industry also, has in many ways given impetus to the improvement of market milk supplies.

The responsibility for the safety of municipal milk supplies, however, devolves primarily on local authorities, and they have large powers in this respect. In a decision of the Supreme Court of the United States, rendered May 12, 1913, the right of a municipality to require inspections and tuberculin testing of milk producing herds outside its boundaries, as a condition

¹ *Public Health Reports*, Reprint from, No. 85, "Methods and Standards for the Production and Distribution of Certified Milk."

² *Public Health Reports*, Reprint from, No. 78.

to the sale of their product within the municipality was affirmed. The right of such authority to confiscate and destroy milk produced and shipped into the municipality in violation of its regulations was also affirmed.

But the powers of municipalities have been delegated to them by their respective States, and in many instances these latter, in order to safeguard milk supplies, have adopted laws or regulations, particularly in respect to notification of cases of sickness and conditions of employment on dairy farms, shipments of milk from infected premises and adulterations of milk as a food.

Further, by a national Food and Drugs Act of June 30, 1906, milk entering into interstate commerce is prohibited from being adulterated or misbranded,¹ and in a decision rendered February 25, 1913, by the District Court of Appeals contamination of such milk by pathogenic bacteria was held to be adulteration within the meaning of the Act.

The necessity of a legal standard was adverted to, however, which would define impure milk by fixing a maximum number of bacteria allowable.

By a Federal Act of February 15, 1893, also, milk in danger of transmitting contagious and infectious diseases may be prohibited from shipment in interstate traffic.

Under the laws and regulations referred to, widespread action has been taken by Federal, State and municipal authorities not only to prevent commerce in dangerous milk, but to improve conditions under which milk supplies are produced and handled. Great emphasis has been given to bacterial counts because the making of them was less expensive and less difficult than dairy inspections, but the latter are also

¹ The powers of the Federal Government extend over interstate and international commerce.

growing in extent, and as a result of both these measures there has been great improvement of raw milk supplies in many sections. In Richmond, Va., one of our southern cities, where a vigorous campaign for clean milk was begun in May, 1907, the average score of dairies was then only 41.5 per cent., whereas in December, 1912, it had increased to 83 per cent., a highly commendable result obtained by hearty co-operation with dairymen and wise enforcement of dairy inspections and other measures.

By reason of the greater interest taking in epidemiology, however, milk is being shown more and more to be the vehicle of disease. This is the most serious indictment brought against it, and the one most difficult of solution. Dairy inspection to the extent practised in the United States undoubtedly contributes to the production of cleaner market milk supplies, but it is inadequate to ensure constant freedom from the infections of tuberculosis, typhoid fever, diphtheria, scarlet fever, and septic sore throat, and to a lesser extent those causing infantile diarrhœas.

Herein lies the sanitary problem of milk supplies. In order to solve it, dairy inspection will necessarily be greatly extended, and the cost of milk correspondingly increased. In the meantime there is no alternative except to pasteurize milk supplies under official supervision.

THE ADMINISTRATIVE CONTROL OF THE MILK SUPPLY.

BY WILLIAM G. SAVAGE, M.D.LOND.

County Medical Officer of Health, Somerset.

It will, I think, be accepted that the milk supply requires special control. Milk is a fluid which is an admirable nutritive material for bacteria, so that much of the bacterial contamination it receives is multiplied many fold; it is a fluid which is obtained under sources and conditions which render bacterial contamination easy, and it is obtained from animals which may themselves be diseased and transmit by way of the milk their disease-producing organisms. Lastly, the arrangements of urban life in this country necessitate that this germ-sustaining fluid shall be transmitted through many hands and be usually some time in its passage from cow to consumer.

Special control of the milk supply is, therefore, urgently required, and the need has been admitted by the considerable enactments which are concerned with its collection, transmission, and sale.

Speaking generally, we have to recognize four separate ways in which milk may be responsible for human disease and ill-health :—

- (1) Chemical impoverization.
- (2) As a vehicle for the spread of tuberculosis.
- (3) As a vehicle for the transmission of the acute infectious diseases.
- (4) As a vehicle for general bacterial contamination.

As regards (1) this is essentially a question for control at the consumers' end, and I do not propose to discuss it here, apart from saying that the present powers are largely adequate if only they were properly enforced. Tuberculosis is dealt with by Professor Beattie. The following remarks, therefore,

refer chiefly to control from the point of view of acute infectious diseases spread by milk and with general cleanliness and the production of clean milk.

MILK AND THE ACUTE INFECTIOUS DISEASES.

As regards acute infectious disease the actual infection of the milk may occur at any stage in the passage of the milk from the cow to the consumer, but a study of the records of individual outbreaks shows that in the great majority of them the infection has taken place at the source of the milk. While, therefore, precautions are necessary throughout, they are especially required at the source of production.

The existing legal powers for controlling these outbreaks are most unsatisfactory. When, as is usual, the outbreak and the seat of infection are in different sanitary areas the delays and restrictions imposed by the red tape requirements of the legal sections are so vexatious that most of the harm is done before the legal machinery can be put in effective motion. Most of these restrictions will be removed if the present Milk Bill becomes law. Even if these sections are made law, they will not go far to prevent outbreaks of infectious disease spread from milk. They are essentially directed to the investigation of outbreaks which have already occurred, and attempting to stop their further spread; they do not *prevent* outbreaks, only aim at limiting them after they have started.

I am of opinion that to prevent these outbreaks it is necessary to recognize that special precautions are required on the part of those who handle milk. It should be compulsory (with penalty of loss of licence to produce or handle milk on default) for every dairyman to notify all cases of illness in himself or his family, or his employees and their families, to the local sanitary authority. All forms and postages for this should be paid for by that authority. Certificates that no illness has occurred to the dairyman's knowledge

should be part of the weekly information supplied by each dairyman to the person to whom he supplies his milk; the latter to provide the special forms required. If on account of illness on the farm, as ascertained by such notifications, the milk supply is stopped by the local sanitary authority, the latter should compensate the farmer. In doubtful cases temporary pasteurization might be resorted to.

The detection and limitation of outbreaks of infectious disease spread by milk would be facilitated if the whole control of the milk supply were under the County Councils with a proper staff to carry out the work.

GENERAL BACTERIAL CONTAMINATION AND THE PROVISION OF CLEAN MILK.

As we are all aware, milk contamination may occur at every stage, but we need to look at the matter broadly. All sorts of well-meaning people come forward with solutions of the milk problem in the shape of improved milk distributors, special milk bottles, and the like. Contamination in delivery must of course be considered and prevented, but after all it is a comparatively trivial source of contamination, and taking place as it does under the eye of the consumer is not likely to be very extensive.

The problem of clean milk in its essentials can be put in a phrase; it is to *collect cleanly and transmit cool*. Do this and the rest, although necessary, is quite secondary.

To get clean milk we must have adequate administrative control over the production of milk. Everyone acquainted with the subject knows that this is just where administration fails, and I think it is hardly too strong to say that, speaking generally, there is at the present time practically *no* efficient administrative control over the production of milk in the greater part of the country.

Of course the dairies, cowsheds and milkshops orders, and the regulations made under them, will be advanced as showing the extensive nature of the control exercised over the production of milk, but, apart from urban areas, it is usually all paper control, and even in urban areas they are frequently more honoured in the breach than in the observance. In many rural districts the register is not even complete and there are many cowsheds which have never been inspected.

In many places no regulations have been made under the orders. It will be remembered that the purposes for which regulations may be made are: (a) For the inspection of cattle in dairies; (b) for prescribing and regulating the lighting, ventilation, cleansing, drainage, and water supply of dairies and cowsheds; (c) for securing the cleanliness of milk stores, milkshops and of milk vessels used for containing milk for sale; (d) for prescribing precautions to be taken by purveyors of milk and persons selling milk by retail against infection or contamination.

Without regulations these matters will certainly not be officially attended to. Further, when regulations are made they not infrequently contain no powers dealing with cleanliness during milking and the cleansing of cows' udders and teats. The point, however, which is not sufficiently realized is that when these regulations are made they are, in practically all rural districts, a dead letter as regards cleanliness precaution in milking, and usually also as regards structural requirements.

The great majority of the members of Rural District Councils are either farmers who are cow-keepers, or persons financially intimately associated with farmers. The officers who have to see the regulations are carried out are without security of tenure, and their salaries are paid by the Rural District Councils, from whom they have to take their instructions as to

enforcing these orders and regulations. The expenses of working them fall locally, both administratively and as concerns individuals; the profit in the shape of clean milk is for some urban population, perhaps far away, who contribute nothing to the expense and who pay no higher price for the clean milk. It is hardly necessary to go further in explanation of the failure of these regulations.

That many cowkeepers take steps, and sometimes efficient steps, to collect their milk pure and transmit it properly, is a fact we are all glad to recognize, but they do so either on their own initiative or because of the regulations of the Milk Company to which they send their milk, and very rarely because of official pressure and supervision.

Control must be removed from the Rural District Councils, who have neglected their duties and have notably failed to insist that even the most reasonable structural conditions and precautions in milking are adopted.

If they are not to control milk production two sets of authorities only remain—County Councils and the Urban Authorities. In my book, "Milk and the Public Health," I have suggested that a special form of urban control is the most desirable. Urban Authorities should be given power to prohibit, after reasonable notice and warning, the milk of all cow-keepers who neglect necessary precautions and whose milk is therefore heavily bacterially contaminated, from being sold in their districts. With the precautions and conditions which I have elsewhere described, I think that this is the procedure which will be most efficacious. This plan does not, however, seem to be within the range of practical politics at the present time, and I do not propose to discuss it further. Also during the last few years County Councils have advanced considerably along the road of sanitary administration,

and there is now much to be said in favour of the control of the milk supply being entrusted to them. County Councils in the future are likely to be much more executive as regards public health matters and will develop a staff which will be in part available for this work.

■ The present Milk Bill goes some way in this direction, but in a very tentative and hesitating manner, and not far enough. The transference of the present duties and powers, and even with added duties and powers, to County Councils will not alone provide a satisfactory solution, and many other considerations must be borne in mind. Of these the following may be mentioned :—

(1) *The Urban Population should contribute towards the Increased Expense incurred by Rural Authorities to provide Pure Clean Milk.*—The benefits are mainly for the towns, and it is unfair if they do not contribute. This may be done :—

(a) By an increase in the price of milk to consumers. This is not an equitable way, since the heavy cost to County Councils of a proper scheme of supervision will have to be paid by many other classes besides farmers, the only ones who will benefit by the enhanced prices. No doubt the cost of milk will be slightly increased, but it should only increase to cover the cost of production.

(b) By grants in aid to County Councils from the Treasury. Since these are contributed by the whole population, urban and rural, this is a reasonable method of distributing the burden. Such grants would further ensure that the work was adequately carried out, since they would only be paid if a satisfactory scheme was in force and maintained. They should be at least 75 per cent. of the total cost.

(2) *The Consumer must be Educated up to the Appreciation of Clean Milk.*—The consumer as an

individual is usually totally ignorant of the bacterial content of his milk and is completely apathetic on the subject. To him good milk means milk rich in cream, and he knows no other standard by which to judge it, and all his wrath is reserved for the milk vendor who defrauds him of his cream. Naturally clean, safe milk obtains no higher price and is not more in demand than dirty or tuberculous milk. There are, of course, numerous enlightened consumers, but they are, from the monetary point of view, a negligible quantity.

(3). *The Cow-keeper must be Educated up to the Necessity of Providing Clean Milk.*—Nothing is more striking in the whole of the milk problem than the fact that cow-keepers, as a class, are quite unaware how grossly faulty are their methods of milk collection and transmission. Speaking from an extensive experience, I have found that the average farmer, while he admits that perhaps a little more attention is necessary, yet thinks that very little is wrong, and he frequently is genuinely indignant when he is told that his methods of procedure and the sanitary conditions of his cowsheds are highly unsatisfactory.

To mention one example. He does not in the least see why stacking his manure just behind the cowsheds, an arrangement which he has seen practised all his life and which is so eminently convenient for farm purposes, should be considered bad. He has for so long regarded his milk business as part of, and to be worked with and on the level of, his other farm operations, that any special consideration for it which conflicts with the proper development of other farm operations strikes him as not only unreasonable but preposterous. That manure should be left for days unremoved from the cowsheds and from the cows he admits is not quite as it should be, but if he can advance the fact that the men were busy at harvest or elsewhere, it seems to

him a quite sufficient explanation. Put briefly, the average farmer does not in the least recognize the *special* obligations of milk collection and transmission, and we shall never get clean milk until this need for special persistent care is brought home to him. Naturally so long as dirty milk commands the price of clean milk, he will not be a very teachable person.

The Transmission of Milk Cool.—The essential point in the satisfactory transmission of milk is to initially cool it properly. I have published elsewhere a number of experiments which demonstrate how very slowly milk cools in bulk, and what a long time is taken by milk properly cooled to increase to a temperature favouring bacterial multiplication.

At the present time in my experience only a small proportion of farmers themselves cool their milk before transmission. On the other hand, a considerable and an increasing part of the milk transmitted by rail to the big towns is sent first to milk depôts adjacent to stations and there, as a rule, it is cooled before transmission, at least in the summer.

In addition to initial cooling, there is the question of keeping cold in transit. The need for rapid transit is fairly well met, but there is need for more special transit. Special well-ventilated trucks are required. If milk is properly cooled I do not think that refrigerator vans are necessary. Of course proper types of churn, &c., are required.

It will be convenient to put together the chief points and principles mentioned above as necessary for effective administrative control of the milk supply :—

(1) Apart from chemical sophistication the essential sources of milk contamination are at the farm, and it is there that the main control must be exercised.

(2) Administrative control must be removed from the hands of the rural and small Sanitary Authorities, who are largely financially influenced in or by the milk trade.

(3) The urban population should contribute towards the expense of administration, since the benefits are mainly for the large towns.

(4) The cow-keeper must be educated up to the *special* obligations of milk production, both as regards special care and cleanliness and the liability of milk to transmit infectious disease.

(5) The consumer must be educated up to the appreciation of the value and importance of clean, pure milk.

(6) If the increased care in collection and transmission sends up the price of milk, this is not a good reason why these necessary steps should not be taken.

(7) The cost of production must be lowered by co-operation, while co-operation must be utilized to transmit milk in a proper condition.

A NOTE ON THE ADMINISTRATIVE CONTROL OF THE MILK SUPPLY, FROM THE POINT OF VIEW OF THE CITY MEDICAL OFFICER OF HEALTH, TOGETHER WITH A NOTE ON A RECENT METHOD OF STERILIZATION.

By E. W. HOPE, M.D., D.Sc.

Medical Officer of Health for the City and Port of Liverpool, Professor of Public Health, University of Liverpool, President of the Society of Medical Officers of Health.

I AM honoured with a request to deal with some of the considerations which specially affect the subject of the administrative control of the milk supply, from the point of view of the City Medical Officer.

The subject is a very wide one, but in view of the part which other speakers are taking in this Conference, I am giving a strict limitation to my observations.

In the first place, the City Medical Officer, in common no doubt with all medical officers, realizes the advantages of an abundant use of good pure milk, at a cost within the reach of all classes. The fulfilment of this need implies that the pure product of a healthy animal shall, in every detail, be so protected from contamination at its source by cleanliness in milking, in transport, in storage, in the depôt and the shop, during domestic delivery and after domestic delivery, that no precautions shall be neglected to ensure its use while sweet, fresh, and clean.

Although large numbers of cows are kept in the great cities, yet, generally speaking, they do not supply more than one half of the needs of the population. The other half is supplied from the country. In a city like Liverpool, for instance, there are approximately 6,000 cows, which supply upwards of 17,000 gallons of milk a day, but the daily consumption of milk amounts to 35,000 gallons per day, or a little more than 7 oz. of milk every day per head of the population. Consequently, a little more than 50 per cent. of the milk consumed comes from the country, and, therefore, in ensuring the purity of the source of the milk supply, the City Medical Officer has as vital an interest in regard to the milk coming from the country as he has in the milk coming from the city.

As the result of systematic bacteriological investigation, it was found, a number of years ago, that a larger proportion of tuberculous contamination was found in milk sent into the city from the country districts than was the case with milk supplied from the city cowsheds. This, naturally, was a matter of very grave concern, especially when it was ascertained that many rural districts had taken no steps to control or supervise the milk trade carried on in those areas; they had not even made by-laws for the purpose, and many that had gone the length of making by-laws had

stopped there, and had never, at any time, taken any step to ensure that those by-laws were given effect to.

As is the case with human beings, so it is with animals kept in confinement in close, ill-ventilated places, the disease with which we are all familiar, viz., tuberculosis, is prevalent, and a tuberculous cow means tuberculous milk ; it was soon found, as one might have expected, that the tuberculous milk came from those rural cowsheds which were without ventilation, without light, without drainage, and from cows which were dirty and neglected.

In order to protect themselves from conditions such as these, many of the great centres of population obtained special powers, under which, among other things, their medical officers, veterinary surgeons, or other duly appointed representatives, were authorized to visit and inspect the cows and cowsheds on any farm outside the city boundary from which tubercular milk was supplied to the city, and, furthermore, to make an order prohibiting the sending of milk from such places into the city, until such time as the premises had been improved, and the sources of contamination dealt with to their satisfaction. These powers worked well, the action of the city authorities led owners and cowkeepers to put their premises into proper order, and to pay stricter attention to the health and cleanliness of the cows, and to the condition of those who milked them. In this way the whole of the country was benefited by the action taken by the cities at the cost and charges of the cities' ratepayers.

Strangely enough, the counties very rarely took any initiative in the matter, or themselves sought any powers by which they could control the recalcitrant rural authorities ; in fact they displayed no interest. There have been cases where, rather than incur the expense of improvements, the diseased milk has been diverted to centres where the supervision was less

strict, hence the necessity for some such legislation as is proposed by the Milk Bill, recently before Parliament, which would give greater powers and responsibilities to County Councils. It would, I think, be well, at all events pending a sufficient time for the County Councils to become familiar with the extent of the proposed new duties, that the powers at present held by the cities should not be taken from them. Finally, in this connection I may point out that in contracts for the supply of milk to Liverpool Municipal Institutions, there are clauses inserted which require that the milk shall be pure and genuine, delivered within four hours of milking, from cows which have passed the inspection of officers of the Corporation, that the premises shall be open to visits from the Corporation officials, and, in addition, that the contractor himself shall periodically visit the farms from which the milk comes, and furnish the medical officer with a veterinary certificate as to the health of the cattle, and fitness of the premises.

It seems hardly necessary to mention that the facilities for keeping cows in a healthy condition in the town are less favourable than those for keeping cows in the country. Obviously, the fresh, sweet open country, the easier grazing, the lower rents, the purer air, all of which tend to maintain the necessary health of the animals, militate strongly in favour of the country, and the city cowkeeper is to this extent handicapped in the competition.

The City Medical Officer of Health, however, has found the city cowkeeper fully alive to the position; briefly, the city cowkeeper fifteen or twenty years ago commenced to put his house in thorough order, and from then onwards has done his best to maintain a high standard in regard to structure, lighting, ventilating, water supply, and cleanliness of administration, into the details of which I will not enter.

Assuming the healthy animal, and clean sur-

roundings at the source, the milk comes through many vicissitudes on its way to the consumer's table. First the milking takes place into a pail, from the pail it is transferred to a strainer, from the strainer to a cooler, from the cooler to the tankard in which it is conveyed to the consumer's door, from the tankard, by means of a measure, to the hand-can, from the hand-can to the jug or basin, and from thence, possibly after transference to another domestic utensil, to the consumer's table. In other words, an article which is particularly liable to bacteriological and other contamination, is handled at least six times on its way to the consumer, a method of distribution, it will be seen, infinitely inferior to that of water.

The importance of purity is accentuated by the fact of the use of the milk by invalids, by children, and especially by infants, to whom it is given as a substitute for mother's milk, frequently in times past with consequences the disastrous character of which is familiar to everybody. It is no more a part of Nature's economy for infants to be reared by cows, than, as in the case of Romulus and Remus, that they should be reared by wolves. The food which Nature designed for human infants is essentially different to cow's milk, but, in addition, it must be remembered that it is never once exposed to the air, it passes directly, at the time of manufacture in the gland, to the infant's stomach; its composition, temperature and mixture adapt it to the needs of the infant; it has neither abstractions, adulterations, preservatives, nor uncleanness, and it is bacteriologically clean and pure.

Depôts have been established in Liverpool for the supply, for infants whose mothers are not able to suckle them, of the nearest approach to human milk. Over 20,000 infants have been fed from these depôts, the cost of which has been largely in excess of the amount paid for milk. While cost is a secondary consideration where human life is concerned, it is

obviously right to lessen cost wherever that can be done consistently with the attainment of the object in view.

In conclusion, I may mention that a large number of careful experiments have been made during the last two years, with a view, if possible, to lessen the cost of sterilization, and careful researches have been carried out at the University of Liverpool by Professor Beattie and others upon the electrical sterilization of milk in flow.

The upshot of these investigations shows that by electrical methods milk can be effectually sterilized, all extraneous organisms being destroyed. No change whatever takes place in the milk, the flavour, taste, chemical composition, and so forth being absolutely the same as in pure fresh milk. The process is very much cheaper than the ordinary pasteurization by heat. Various pathogenic organisms have been experimented upon with perfectly satisfactory results.

The Corporation have authorized the installation of a plant at one of their depôts for this process, which has now quite passed any experimental stage, and which has, I believe, a very valuable future before it.

THE CONTROL OF THE MILK SUPPLY FROM THE POINT OF VIEW OF THE VETERINARY INSPECTOR.

By J. W. BRITTLEBANK, M.R.C.V.S., D.V.S.M.

Manchester.

THE whole problem of the improvement of the conditions under which milk is produced bristles with difficulties, inasmuch as attempts at interference in the direction of improvement are met with opposition at every point; and further, it must be remembered that any concerted and organized scheme of

action which is pushed too rapidly will have as its immediate result the forcing up of the price.

It is not my particular business to come here to offend dairy-farmers, but I have had a good many years' experience, first of all as a veterinary practitioner in a country district, and for the last twelve years as a veterinary officer whose duty it has been to inspect dairy farms whence milk was sold in the city of Manchester; and as the result of the accumulated experiences obtained, I have come to the conclusion that to a very large extent we approach our subject from the wrong standpoint. I plead rather for a policy which shall have for its basis the statement of fact and the abolition of sweeping statements.

It is perfectly true to say that many of the conditions under which the production of milk is carried on are objectionable, that on very many farms the dirty conditions are appalling, and that there is little doubt that no inconsiderable proportion of the cattle producing milk are diseased.

Let us take first of all the dirty conditions. It would be scarcely possible to find a farm which is not carried on under conditions which are scientifically dirty, and on a very great number so badly are they constructed that it would be almost impossible to attain conditions even of "practical" cleanliness. This appears to me to be the crux of the whole question.

In the first place a large percentage of the individuals engaged actually in cow-keeping have not the slightest conception of what scientific cleanliness means. As an individual the farmer has been brought up, as have many generations of his progenitors, to believe that the actual dirt of the farm, which is of course mostly manure, is no unimportant monetary factor, and further that manure, as manure, never did anybody any harm. Are you going to clear his mind of the falsity of his beliefs by merely rushing into the

press and saying he is a dirty vagabond, and that being dirty he must of necessity be dishonest and without conscience? I venture to say that you will do nothing of the sort. He will meet his friends in the evening, possibly at the local shrine of Bacchus, and he will promptly designate you as a worthy inmate of the local asylum for the mentally weak. On the other hand, approach him as a reasonable being, with a certain amount of licence to existence, demonstrate to him in a practical manner where he is mistaken, point out by analogy and example where he errs, and don't lay too much insistence on the presumption that he is an ignorant fool, and I venture to say that you will leave behind you a nucleus which will in the course of time develop along the line which is so urgently desired.

Addressing myself to the administrative measures which appear essential, it may be at this point necessary to point out that there appear to be two distinct schools, each of which advises different courses of action.

There are first of all those who believe that the proper method to deal with the improvement of the milk supply is to so sufficiently alter the conditions at the source of production as will ensure the output of a supply of milk which will be safe for the consumption of both children and adults.

On the other hand many believe that it is so difficult to effect this improvement, that they would discard serious attention to such measures and would confine their attention to treating the milk itself in such a manner as to render it innocuous no matter what its source. With those who would associate themselves with the latter policy I have no argument, except to suggest that it is clumsy and economically bad, and I am a firm believer in the policy of dealing with the sources of production first.

It might be advisable at the outset to attempt

to ensure a sufficient supply of pure milk for the use of children, but even this would be extremely difficult to carry out, because, after all, parents are free agents, and a very large number are compelled to buy in the cheapest market. I therefore favour general measures applicable to all concerned.

The question which then arises is concerning legislation on the subject. The powers with which such work can be carried out at present are (1) the Dairies, Cowsheds, and Milkshops Order, and (2) the Public Health Act.

There has been for some time a considerable demand for a new Milk Bill, and the proposed Bills which I have seen are admirable enough in themselves, but in my humble opinion the existent Dairies, Cowsheds, and Milkshops Order with a little amendment would be a most admirable piece of legislative work. Unfortunately this Order is not compulsory, and even where adopted has not been carried out. I believe that if this Order were made compulsory and placed in the hands of the large authorities such as the County Councils, to administer, an enormous amount of good would result. It is not to be wondered at that to a very large extent the carrying out of the Dairies, Cowsheds, and Milkshops Order has been a dead letter. Placed in the hands of the small local authorities to administer, it was not to be supposed that the elected representatives would have any violent desire to be particularly harsh on themselves.

In another sense the present situation is grossly unfair: in the large centres of population, most of which have farms situated in their areas, this Order is administered more or less thoroughly; often enough just outside the boundaries no notice at all is taken of it, and yet the farmers of both districts have to compete on an equality for trade, as there is nothing to show that the milk sold by one man is produced under proper conditions, whilst the individual from the

uncontrolled area may have a farm which is insanitary and dirty to a degree.

I am convinced that one of the first things to be done in this country to improve the state of the milk supply is to sweep away the awful conditions of housing cattle which exist.

Unfortunately at present the person legally responsible for the insanitary conditions of the farm is the tenant. The full responsibility should be placed upon the landlord.

Often enough I have found when I have tried to get improvements carried out, that when the tenant has approached his landlord to ask him to do something for him, he has been told that if the conditions are not suitable for milk-selling, he will have to stop and start cheese-making or rearing. I know the situation is a difficult one, and far more difficult than appears on the face of it; but there can be no question that the owner of property must be made to fulfil his obligations; at present these obligations are more in a moral sense than a legal one, and the only one which is of real value is the legal one. Many landlords cannot carry out the work required, their estates are so heavily encumbered that it has become impossible to spend money on the tenants; but surely in a work of such immense national importance, both to agriculture and the preservation of the public health, it is not too much to suggest that where such a set of conditions does exist, compulsory powers should be available for insisting on the work being carried out, the State to advance loans at a low rate of interest and repayable over an extended period.

I have seen it stated that this is not really the crux of the problem, but that the dirty conditions existent are of far greater importance. I know what it means to keep stock, and I have experienced the many difficulties, and I tell you it is impossible to keep these dark, unventilated, overcrowded places clean. But

let in the light of day, provide a plenitude of fresh air, and I venture to say that the stock keepers themselves will soon recognize the value of the improved conditions.

It must not be imagined that I wish to attack landlords. It has been my pleasure to meet many who at great personal sacrifices have carried out very great improvements. The county of Cheshire is one which I visit most, and largely due, I believe, to the administration of the Manchester Milk Clauses, in the first instance, the improvements have been enormous. In many cases the agents have a free hand to carry out any improvements suggested, and much excellent work has been done.

Here I wish to raise a question of some considerable importance, and that is, where reconstruction of premises is carried out it has often failed to achieve the object aimed at.

The responsible work of advising what is necessary is too frequently left to a person who knows nothing at all about the work. He may be an expert on drainage and understand the carrying out of many of the requirements of the Public Health Acts, but each man seems to have his own pet idea as to what constitutes a good cowshed. Some of the alterations which I have seen carried out are ridiculous, but it is unfair to blame the individuals concerned, they have little or no technical knowledge of the subject. There could be no better illustration of a little knowledge being dangerous, and, apart from this, it is unfair to ask people to spend money to no purpose.

In every such case the premises should be visited by a responsible person who shall thoroughly understand his subject. It is surprising, even on the most insanitary and apparently hopeless premises, what a little ingenuity will effect. It is fully time that some standard was laid down, and so prevent much of the waste of money which has gone on.

A full and proper system of skilled inspection should be instituted. I do not mean that men should be employed who would visit the farms wishful to impress upon the farmers the importance of their positions and bursting with the importance of officialism.

Inspection by individuals of this class achieves little ; it merely breeds resentment, and often enough distrust. Sympathy, tolerance, and tact are required in addition to a good practical knowledge of their subject. The farmers should be treated as responsible beings, and they should be made to feel that the object aimed at is rather to help them in their work than persecute them. Police methods should never be employed, but the administration need be none the less firm ; there need be no pity for the deliberate wrongdoer, and he should be treated with the utmost severity.

Dr. Niven, Medical Officer of Health for the city of Manchester, has for many years recommended the establishment of a Public Health Veterinary Service, and as a member of the veterinary profession I cordially endorse all he says ; but I do not wish to enlarge upon the subject. Many side issues seem to be forced to the front to prevent its achievement, but surely on a subject of so much importance professional jealousies need not exist, as there is plenty of room for work for all disciples of medicine.

Legislation is, of course, essential to all public work, but its chief value is educational rather than corrective. In the years I have spent in this special work I have found that if you can gain the confidence of the people with whom you have to deal, they will do a good deal for you, and a great deal can be achieved without much fuss.

As we are situated at present it is only necessary for a milk seller to apply for registration and he must be put on the register without discretion ; in place of

this I would institute a system of licensing, not necessarily for any limited period, but such licence to be a guarantee of the conditions in regard to the essential requirements of a pure milk supply. I would not make the conditions too stringent at first, as it would be disastrous to bring about a condition of things which caused a famine in milk.

I am convinced that the effects of such a system properly carried out would be enormous. The improvement would be so great as to justify all the trouble at the outset. It would be resented, it is true, but most legislative measures are. There should be good security for the holding of a licence and it should not be in the power of any officer to cancel such licence; the holder should have full protection. The licensing authority should be the sanitary committee of the administrative county, whose decision should be final.

It may be contended that the holder of such licence should have the right of appeal to a Government Department, but I think there is little likelihood of any injustice being done, and if any appeal is advisable it should be to quarter sessions.

I am afraid I have only been able to treat the subject very superficially. The subject is an immense one and quite impossible to deal with adequately in the scope of a paper such as this, but the conditions required to improve the milk supply may be summarized as follows: Effective legislation; complete re-construction of all insanitary cowsheds; thorough cleanliness of all premises and cattle; cleanliness of all milkers, milk vessels, dairy, &c.; efficient trained inspection.

I have not been able to refer to the very wide subject of communicable diseases. These require special treatment, as the whole subject is a difficult one, but some reference may be permitted to the most important of them, namely, tuberculosis.

The Board of Agriculture have promulgated an

order called the Tuberculosis Order 1913. This came into force on May 1 of this year and we have very little material at hand up to the present to enable us to judge of its efficacy. It will not do at this stage to criticize this Order, I do not at any time believe in destructive criticism, and it is admitted in the circular letters issued from the Board that the Order is to a very large extent experimental. I do not believe that the Board of Agriculture expect to achieve very much from this Order, but rather regard it as a preliminary to further and more far-reaching measures for dealing with this scourge.

Those of us who have had much experience of the disease recognize fully that the only satisfactory goal to aim at is complete eradication—an apparently superhuman task. We know full well that practically one-third of the dairy stock of this country are tuberculous in some degree; fortunately only a comparatively small proportion of these are dangerous to either their fellows or human beings, but the magnitude of the work which requires the elimination from our herds of approximately 1,000,000 cows must be recognized, and it behoves the authorities to proceed with caution. It has nevertheless been demonstrated that bovine tuberculosis can be eliminated from herds, and that such herds can be kept free from tuberculosis, and it has further been shown that this can be carried out on a commercial basis and not merely as a scientific fad. It is to be sincerely hoped that this great work will not be unduly delayed.

If I may transgress for a moment in conclusion I would say that the whole hope for the future lies in the rising generation of agriculturists. Many subjects of a more or less useful character are taught in our rural schools, but I am strongly of opinion that the subject of animal hygiene should be included. The inculcation of knowledge of the principles governing the development and spread of disease is of the

highest importance, and if the opportunity is taken of placing this knowledge before the boys during their last year at school I believe it would have an enormous effect within the next few years on the whole subject of agricultural hygiene.

DISCUSSION.

Dr. HOPE (Liverpool) said he would like to add one word in reference to the valuable observations which had fallen from Dr. Biggs. It was evident that the conditions in America were very different from those which prevailed in this country—for instance, here we should never have milk thirty-six hours in transit. That was one illustration of the difference that existed in the large American centres and the large cities in England. The proposal which had been given effect to in American centres of having three grades of milk was a very useful one, and might, he thought, be adopted in many instances in our own country, but one must bear this in mind—that although they might give very careful attention to the three grades which Dr. Biggs had described, they could have no guarantee that after distribution the precautions which he had described would be given effect to, and that the third grade of unsterilized milk would be used only for cooking. It might be employed in exactly the same way as the best grade was employed—for the feeding of infants. With regard to sterilization, while he was sure they all appreciated its value, they must bear this in mind, that it might lead them into another danger, that they might rely upon sterilization rather than upon purity of source. Once they got into that mistake any one city might protect itself, but the smaller towns and the small centres of population would not be able to, so that the measures which they might employ for their own protection would be a source of danger to other portions of the community which were less satisfactorily circumstanced than the big towns. They must insist upon milk being pure at its source as they did with water. They filtered their water, and did everything that was possible to ensure its purity when delivered, but they most religiously attended to purity at its source. No one would be satisfied to have diluted sewage brought into water mains, because one knew there was a good system of filtration—one would rightly demand that the water, even although filtered, should come from a source of undoubted purity.

Surgeon-General Sir CHARLES P. LUKIS (India) said it was no easy task to deal with the subject of the administrative

control of the milk supply in India before a European audience which was unacquainted with the local conditions. In the few remarks which he made yesterday he emphasized the difficulties which beset the path of the sanitary reformer in India—difficulties largely due to the prejudices of the people and the conditions of their environment. These difficulties reached their maximum when they came to deal with the problem of the native control of the milk supply and the artificial feeding of infants. It must be remembered in the first place that in India the cow is looked upon as a sacred animal, and secondly that caste prejudices prevented the taking of food prepared by outside agencies, or which had been touched by persons of another caste. For these reasons it was very difficult, even in the large cities, either to ensure efficient control of the milk supply, or to render polluted milk innocuous by pasteurization, or to substitute dried milk in lieu of a doubtful supply of the fresh article. And this difficulty became an impossibility when they had to deal with the small scattered villages in which eight-tenths of the population resided. Luckily for them, Indian cattle did not suffer at present to any great extent from tuberculosis, and on the rare occasions on which tubercular disease had been traced to milk the contamination had nearly always been by tubercle bacilli of human origin, which had been introduced as the result of the carelessness of the native milkmen. Moreover, Indians always boiled their milk before using it. An Indian would be horrified at the idea of drinking unboiled milk, even more so than any of those present would be if they were asked to devour a raw mutton chop. But, although milk-borne tuberculosis was not yet a serious problem in India, the question of infant feeding was one of vital importance. Major Robertson, the Sanitary Commissioner with the Government of India, who had made a special study of infant mortality, was of opinion that the four chief causes of death in that country were: (1) Malaria, which may act either directly on the child, or indirectly through the mother. (2) Diseases due to insanitary surroundings. (3) Diseases due to ignorance on the part of the mother with regard to the feeding and care of the infant. (4) Accident of childbirth and diseases attendant thereon. As regarded the last two causes, a consideration of the available material led him to the conclusion that early marriage was a very important factor in the causation of excessive infantile mortality in India, where the marriage of girls was almost universal, and that at the earliest practicable age. And he thought there could be no

doubt that a large proportion of the deaths of children under 1 year of age was due either to the immaturity and ignorance of their mothers, or to the severe physical labour which Indian women of the poorer class were called upon to perform. He was glad, however, to be able to state that in India they had not to contend with the difficulty mentioned yesterday in connection with native mothers in Australia. The Indian woman was a model wife and mother, and if she erred in the management or feeding of her child, it was merely through ignorance, and not from want of maternal affection. Another adverse factor vying in importance with that of early marriage in determining the excessive infantile mortality was found in the primitive methods of midwifery almost universally in vogue, and the complete disregard of proper precautions during the puerperium. Such methods not only led directly to the death of the infants from tetanus and various septic infections, but indirectly increased the infant mortality by depriving the children of their natural nourishment. It must be remembered that owing to the unsatisfactory nature of the diet substituted for their mother's milk, the death of the mother or the drying up of her milk practically sealed the fate of the child. Bearing in mind therefore what he had said with regard to the prejudice of the people, and the conditions under which they lived, he felt that in India, whatever they might succeed in accomplishing in the large cities (and they were doing their best), their aim so far as the rural population was concerned—which they must remember constituted 90 per cent. of the whole—must be not so much the control of the milk supply, but rather the eradication of malaria, the education of the masses in domestic and personal hygiene, the building up of the physique of the mother so as to fit them for all the duties of maternity, and lastly their protection from the dangers of childbirth. In fact their aim should be to secure for every child born into the world an adequate supply of natural nourishment, and not to substitute for this the milk of an alien animal, for no matter how carefully they might humanize or pasteurize it, they could not get away from the fact that Nature intended cow's milk for calves and not for human babies. This might be a counsel of perfection, but, after all, perfection was what they were aiming at, though he feared that many centuries would roll by before they attained to it.

Dr. HENRY L. COIT (Medical Society of New Jersey, U.S.A.) said that when he consented a few moments ago to speak upon the question of the milk supply he did not expect to be asked to open the discussion. Had he known before-

hand he would have spoken in a more comprehensive way than he felt able to do at that moment. The question of pure milk was very near to his heart. It had been very near his heart for more than twenty-five years. He had been a physician for thirty years. Five years after he began his medical work he became convinced that the question of pure milk was a vital one, as it concerned the life of their infant population. He might commence by saying that in the United States there was a very happy relation that existed between the medical profession, the sanitary authorities, the Federal authorities, and the municipal governments; they also had similar co-operation between philanthropists and those government authorities. That was evidenced by the representatives who had come over to attend that Conference, and by the fact that the question which had its inception in the minds of medical men was reported upon that day by a Federal officer, Assistant Surgeon-General Kerr of the United States. Five years after he (Dr. Coit) began his medical crusade for clean milk, which was designed especially for clinical purposes, and was still so limited in its effects, the Federal Government began to take an interest in the question, and authorized by an Act of Congress the health officer of the City of Washington to make ordinances that would control the supply of milk. From that point on a great interest had been aroused in the question of safe milk, and from that point there was history which was a quarter of a century old, and which he had no doubt was familiar to most of those present. Judging from the reception accorded him the previous day in the medical section of the Conference, he had been obliged to conclude that the rank and file of the medical profession on this side of the world were not yet prepared to say that they wanted and must have safe milk, or what they were satisfied to call in the United States clean milk or sound milk. There was a difference between safe milk and sound milk, and a vast difference between clean milk and sound milk. Milk might be cleaned by the effects of heat; they could boil milk and make it clean from a medical point of view, but there was no such thing as milk in its initial condition without the contaminations from the stable. There was no milk that was not contaminated with manure, and a great deal of it was contaminated with bovine bacillus. He was of opinion that to be satisfied with the effects of heat in making milk suitable for the use of the population and for the purposes for which doctors required it was merely to hide and make inefficient the efforts which they were trying to stimulate in connection with the initial cleanliness of milk at the sources

of supply, so that they might have good or clean milk. In the United States he represented one phase of this question, and that was the part taken in the programme and in the crusade by the physician. He was inclined to think that in some countries—perhaps not in England—the reason why physicians did not take a more radical interest in this matter was because they were afraid that by so doing they would detract from their professional dignity or reputation by being willing to co-operate with a commercial institution, or by being willing to go to the dairyman and associate with him in this vital question of getting what they required for the hospitals and the sick-room. He was also convinced that they had not got certified milk in England, not because they did not need it, but because they did not know what it was. (Laughter.) He had very clear evidence of that in correspondence which he had had with English physicians and with health authorities in this country. Some six years ago Dr. G. Still, a physician in the Great Ormond Street Children's Hospital, told him that they were just about to have certified milk in London. He had been in London four times since, and he had never seen any certified milk there. The previous day in the medical section his (Dr. Coit's) paper was treated with scant courtesy in regard to the amount of discussion upon it. He was asked to speak in five minutes what he had come 3,000 miles to say in fifteen. He supposed that, because there was no discussion, therefore the propositions which he put forward were generally approved and agreed to, but the object which they had in view could not be accomplished by merely assenting to a proposition; he meant that there must be co-ordinate association of interested men who recognized the importance of the proposition, and who would band themselves together for a crusade that would last their whole lifetime. The getting of clean milk was a problem that was renewed twice in every twenty-four hours, because cows were milked twice in every twenty-four hours. Dairy hygiene had no existence in the world until in America that crusade for clean milk was taken up by the medical profession. He could quote several authorities who had made that statement during the last twenty years. If they should say that better veterinary control of the milk supply was sufficient that would be a falsification. The previous evening he was introduced to a gentleman farmer. He (Dr. Coit) thought he was a doctor—he looked like one. (Laughter.) He was introduced to this farmer with the remarkable words, "This is the gentleman who has given England certified milk." After a few minutes' inquiry he found that this gentleman was making

seventeen quarts daily of what he was calling certified milk, but he (Dr. Coit) soon convinced him that the term "certified" was a falsification. If they were to regard milk containing a low count of bacilli as certified that would be false, because they had such milk that was being delivered in New York, but it was not certified milk, because it was not milk of guaranteed safety. The plan for obtaining certified milk in the United States included four methods of control. There was the veterinary supervision of the herd with tuberculin, the actual guarantee, the chemical examination, and the bacteriological examination for the purpose of determining the food values of the milk and its cleanliness. He would like to claim the honour of having suggested bacteriological examinations for the control of dairy hygiene—a thing which was never done before the plan which he suggested twenty-four years ago. Since then there had grown up centres where milk bacteriology had become a science, and had given a livelihood to many bacteriologists. Let him give them one clear instance of what was necessary in order to thoroughly carry out this programme of the chemical supervision of dairy hygiene, and medical control of the employees. In the United States they had seventy-two of these medical commissions authorized by representative medical societies in twenty States, banded together in a federation, and that meant over 500 doctors, and he was pleased to be able to announce that four or five weeks ago Dr. Kerr was made President of that body of physicians and sanitarians. That Commission stood for clinical milk; not for market milk. They found that certificated milk dragged everything up with it, because it was an object lesson; it was educational in its effects, and it stimulated the dairyman. The market milk problem was greater because it touched a larger proportion of the population, and until they got market milk clean, certified milk would have but a small incidence upon the mortality; but as he had said it was educational in its effect, and in that way it touched the whole problem of the milk supply. The instance which he wanted to relate would show them what he meant. There was a dairyman in the United States serving something like 6,500 quarts of milk per day into a community where there were half a million people, and who had influenced the whole problem of the milk supply for that community. This man one day was informed by the dairy physician, who lived within a mile of the plant, that there was one man in the gang who had been put to bed. They telephoned to him (the speaker) as Chairman of the Commission, and in reply to a question he was told that the man had a little fever.

He got the Secretary of the Commission to communicate with the twelve members, and the committee left their offices and their patients and went twelve miles the next day to meet the dairy physician and inspect the man who they were told was suffering from a slight fever. They found fever, but the man was only a little out of sorts and wanted to go back to work the next day. The next morning the dairy physician called upon the man and found spots upon his chest. He thereupon again telephoned to him (Dr. Coit), and the following day the committee again went to the dairy and made a diagnosis of scarlet fever in the man, who was a young married Pole. The committee got together and spent an hour or two with reference to their duty to the 4,000 families to whom this certified milk was to be delivered, and they asked the dairyman to come, and he did so. That, he thought, was an evidence of the altruistic spirit which was to be found in some dairymen, and that man was at the Conference that morning. He said, "Doctors, I will throw these 6,500 quarts upon the ground if you say so, and I will let a big dealer supply my 4,000 customers." They said, "No, we will cook your milk for a few days during the period of incubation for scarlet fever," and they required him to employ a sanitarian from New York, which cost him £100 to supervise that milk for a period of twenty days. The result was that the people stood loyally by him, and only twelve out of 4,000 customers discontinued to purchase that milk. Another result was that they succeeded in more firmly establishing their system, because the medical profession had confidence in their principles. They refused any reward for their work, and as doctors they were continuing that work in the United States for the good of the people. He was convinced that the same system was necessary in England, and the people of England deserved it just as much as they did in America.

Dr. C. Q. LENANE (Battersea) said that as a medical officer of health of a London borough he had been very much interested in the discussion as his authority had taken very considerable interest in the question. In listening to the papers which had been read that morning he had been particularly struck with the one which had been read by Professor Beattie. It was a well-known fact that in London, where the question of the milk supply was such a very urgent one, the control of the supply was very unsatisfactory. That arose from the fact that although the sanitary authorities in London were very keen in looking after their milk supply, they had practically little control of it until it came into their particular district. In the district of London

of which he now had charge they had a milk depôt which had been in existence for twelve years, and during that time they had fed something like 10,000 infants, and the result was very satisfactory, because they had taken care to secure a sound article of milk. That had been an extremely difficult thing to do. At times when they applied for contracts they got quite a number of applications to supply milk. The medical officer of health had the duty of going down and inspecting a number of farms. He could assure them that it had become monotonous for him to inspect farm after farm and to find that the conditions prevailing on them were not sufficiently satisfactory to make it possible for the owners to comply with the specification of the contract, which required a sound milk supply, and they had had perforce to go to the extent of paying 2d. and 3d. per quart above the ordinary price in order to secure a milk which would comply at least to some extent with the specification of the contract. Under those circumstances he thought it was unnecessary to say that the administrative and sanitary control of the milk supply of England at the present time was most unsatisfactory. In districts like Liverpool where they had a special Act of Parliament they were better able to control the milk supply than they were in London districts. It was only within recent years—within the last three or four years—that even any precautions had been taken to secure information as to the actual amount of tuberculous milk coming into the County of London, and it had been shown as a result of the powers which the London County Council secured in their General Powers Act in 1907 or 1908 that something like 11 or 12 per cent. of the milk supply which they had examined had been found to be tuberculous. Having regard to those facts he thought it was high time that in this country they should adopt or use some of the enterprise that their American cousins were showing in getting control of this most important industry. The question of the grading of milk which had been referred to by some of the American speakers was one which he was rather disinclined to consider as satisfactory in this country. He thought that they might say that we already had the grading of milk carried on, in so far that practically the traders themselves graded milks, and in the poor districts milk was sold at 3d. per quart, whereas in the better class districts 5d. per quart was charged for it. That indicated that the quality of the milk that was sold mostly in poorer districts was a low grade milk. There was considerable reason to believe that the source of supply was very unsatisfactory, and that the milk

which was consumed in the poorer districts was largely responsible for the high incidence of diarrhoea mortality which prevailed in the summer months in their city. He thought therefore that in considering the milk supply the Conference ought to impress upon the nation the vast importance of securing a National Milk Bill, which should be effective in controlling the milk supply at its source, and not leaving it in its present unsatisfactory condition. Having regard to the immense importance of the matter and having regard to the vast size of a city like London, there was practically no opportunity of effectively controlling the milk supply unless it came under a central authority.

Mrs. J. KINGSWELL (Portsmouth) said she had been very much interested for many years in the feeding and care of young children and infants. She would like to ask whether the doctors advised dilution of milk with water—and in what proportion—when it was used for the feeding of young children, or whether they advised the whole cow's milk for young children. There seemed to be a large diversity of opinion on the point.

Dr. F. E. FREMANTLE (Hertfordshire) said in the regrettable absence of Dr. Savage it might be as well if a few of the county medical officers of health expressed their views in the discussion. One spoke from a personal point of view, and they all had their differences, but on the general principles regarding the milk supply he thought that all county medical officers were fairly at one. The discussion had been most interesting to all of them and most useful, but of course the differences between themselves and other countries made some difference in their pronouncements. Dr. Kerr's paper, most useful and interesting as it was, he could not help feeling led one too much to rely on methods that were essentially expensive, such, for instance, as the pasteurization of all the milk supplies. That might be well in the United States, but here they had above all to recognize the fact that they had learned by difficult experience that excellent as were the suggestions for improving the quality of the milk supply, the difficult thing they had to cope with was to get an abundant supply of milk, as well as seeing that the milk was of good quality. If the proposals were going to increase the price of the milk they would reduce very largely the consumption of milk. The improvement of the quality would be an advantage to those who secured it, but he was afraid that the increased price would reduce the consumption of milk among precisely those elements in the population that they wanted to get it. As he stated the previous day, they were always in danger

of legislating and regulating for those of the well-to-do and the comparatively well-equipped families of artisans, &c., who could on the whole be left to look after themselves with a certain amount of advice and assistance. What they wanted to do was to legislate and regulate for those who were not able to profit by those things, and all such measures were not worth anything—in fact they were bad—if they were going to make the poor suffer in order that the better off and more intelligent classes might have the advantage. That, he felt, was the most important element in the milk problem, and anything that would raise the price of milk must be most carefully looked at before they advocated it. They in this country differed from the United States in the fact that in a general way our milk supply was a great deal better than might be imagined from reports which one sometimes read in the newspapers. They knew too well the difficulties of it and the disadvantages, but in many ways it was certainly improving, and he believed it could be relied upon to improve still more in the future. They must not hasten the pace unduly by making too policemanlike regulations. They had got to educate the farmer and the public, and in that way they could do much to improve the milk supply. If they did that gradually they would be able to bring about an improvement without any increase in the price, but the suggested drastic measures would only make things a great deal worse. That was one point in which he took exception to Dr. Savage's excellent paper, because he said that if the price were raised that would be no objection in itself. He (Dr. Fremantle) would say that in itself would be an insuperable objection. The next point was that in any measures they took they should see to it that they threw the responsibility upon the right shoulders. The responsibility must be thrown upon the dairyman, and he was afraid that if they adopted such measures as the general pasteurization of milk, it would be to the advantage of the uncleanly dairyman, who would then be taught to realize that he could rely upon those measures for getting over the bad results of his uncleanly milk, and instead of inducing him to produce pure milk, it would make him more careless, because the milk being pasteurized, the bad results of their dairying would not be shown. He believed in throwing the responsibility upon the dairyman, and let them bring the responsibility home to him by every means in their power. If they educated the dairyman they could get him to improve his methods without raising the price of milk, and by doing that they would be gradually eliminating many of the dangers in the production of milk. The way to

improve our milk supplies was by visiting with the severest penalties of the law the actual cases where the trouble lay and where the failure of the dairyman could be brought home. That was his difficulty again in regard to Dr. Coit's suggestion with respect to certification of milk. It might be an excellent thing for people like themselves if they could demand certified milk, but he could not help thinking that people such as themselves could look after themselves to a large extent. Certified milk if they had it would perhaps be used by the better classes, but he believed it would be avoided by the classes in whom he was almost alone interested—the very poor. He believed that in one of the papers he read that in the United States certified milk was retailed at from 12 to 14 cents a quart. That was equivalent to 8d. or 9d. a quart, and that came to about 2d. a half-pint glass.

A DELEGATE said that the doctors were allowed to order that milk in New York for the poor.

Dr. FREMANTLE said he was not thinking of the price in that connection, although that was an objection, but was thinking of the general use of such milk. He was dealing with the position as a whole. There were exceptional cases and exceptional towns where they could get a pure supply in other ways than by certification, and he could quite see that such milk was of value in exceptional circumstances. They had heard from what Sir Charles Lukis had told them of his own area how it was of great use in such a place as Calcutta, where it had got a certain educational effect. He could not help feeling that the power of supervision of the farms in the counties outside the large towns should continue for a time. The Milk Bill proposed to give that responsibility to the county area. Dr. Hope proposed that there should be concurrent powers given to large towns to go outside their area. He (Dr. Fremantle) felt that that was delaying the responsibility of the local authorities for looking after their own local dairymen—that was to say the local authorities in the county would still be inclined to say, "This affects Liverpool, London, Manchester, &c.; we need not worry about it." It was only by throwing the responsibility undivided upon the local areas that they would get the responsibility recognized by the dairyman. They must have a system of constantly keeping the dairy farmers up to the mark, and in visiting them with severe penalties in the event of their failing to act properly. The system suggested by one of the papers for obtaining better control of the milk supply through veterinary surgeons was one for them to look forward to in the near future. The veterinary

service was in a very early stage at the present moment. It was suggested that there should be a veterinary service which should consist of whole-time experts. He did not think that in county areas they were yet ripe for whole-time veterinary services and he was not at all sure that they ever would be, or that part-time service would not be the best way of dealing with the problem. They must have proper supervision, and to appoint veterinary surgeons here and there in different localities under small authorities would be to court disaster. The veterinary service was an expert service and it should be taken entirely out of the ordinary sanitary or local government work and should be made into one great army of national service to be controlled like the National Reserve service of the Army and Navy, and should be posted to work according to the wishes of the local authorities; in that way they would be relieved of a very large amount of expense in administration. Such expert services he felt could never be managed satisfactorily while under the control of the local authorities. The future lay with national service in that respect, but until that was obtained he felt they must have a system by which the veterinary surgeons and the bacteriological reports, which were suggested to them as necessary, must be under the supervision and control of the medical officer of health, who was responsible for the general superintendence of the health of the county.

Councillor MARGARET ASHTON (Manchester) said that one of the points which had been briefly touched upon by Dr. Fremantle was, in her opinion, a most vital question, and she wished to emphasize the fact very strongly that every time they improved the quality of milk they increased its cost and that the quantity of milk in England in our large towns and also in the country was at present entirely inadequate to the fulfilment of the whole needs of the population. Every time they made it more difficult to get a sufficient quantity of milk they were doing more injury to infant life than they were doing good by improving it. While the discussion had gone on she had been more and more sorry that they had not heard the paper by Mr. Brittlebank, the veterinary surgeon from Manchester, who dealt with some of the points as to the disadvantages of raising the cost of the production of milk. She had been very greatly disappointed that they had heard no suggestions whatever from any of the speakers as to the municipalization of the milk supply. When she saw the headings of the papers to be read, "The Administrative Control of the Milk Supply," she imagined that they would have had some

suggestions as to the municipal supply of milk. They had heard of a milk depôt here and there, but that did not in any way meet the needs. These milk depôts were very limited in their scope and they were always voluntary or municipal agencies on a charitable basis. What they required was a municipal milk supply exactly like a water supply. It had been found quite impossible for the individual consumer to supply himself with sound, pure water. It was equally impossible for the individual consumer to obtain for himself a sufficient supply of pure milk. They could never face this question of pure milk for the community until they made the municipality responsible for the supply and sale of pure milk at a price that was within the reach of the poor people in the community. She had hoped very much that they would have heard in the discussion not only how to purify milk, but how to supply that pure milk at a reasonable figure. The discussion seemed to her to lack vitality. They all knew the powers which local authorities possessed under the Dairies, Cowsheds and Milkshops Order, and many of them were trying to get the Milk Bill amended, but that did not meet the need. Both in town and country the supply was inadequate because of the cost. If that Conference would make some definite proposal asking for an inquiry to be made into the possibility of municipalizing the milk supply, she thought that it would bear far more fruit than if they were to continue to discuss how to purify the milk supply. They were all at one for purifying milk, but they had not yet seriously considered the question of supplying it at a reasonable rate for the poor. At present they could not expect that the poverty-stricken classes in England would be able to get a sufficiency of milk to keep their children in good health. They found in many parts of the country that whole milk was being given to the pigs and calves, while babies had only skim milk. It was the duty of the community to put within the reach of the poor the necessities of life, as they did in the case of such things as water and gas, and they ought in the same way to see that a food like milk, which was vital for the people, should be within the reach of the poorest. They had no right to say, "You shall not have milk, because it is of such a bad quality that we won't allow you to drink it," unless they provided the people with good quality milk at a price they could pay. She wanted to see a discussion as to the means of municipalizing the milk supply and she was dreadfully disappointed that neither from the point of view of the cities nor of the country towns had this question of the supply of milk been touched, although it affected the lives of infants and children very largely.

Dr. GEORGE SCHOLEFIELD (West Lancashire) said that as medical officer of health of a rural district in Lancashire, not far distant from Liverpool, he would like to say a word or two on behalf of the rural districts. Dr. Hope, in his paper, probably rightly blamed the rural districts for sending impure milk into the large cities. He would like to tell the Conference what they did in his district; perhaps as regards that particular district, which was largely of a rural character, some of Dr. Hope's strictures would be removed. Some ten years ago they had no by-laws under the Dairies, Cowsheds, and Milkshops Order. The Council, of whom about two-thirds were connected with the farming industry, had not seen any necessity for having such by-laws, but after he had for three or four years pointed out to them the necessity of such by-laws, they at last consented to adopt them. Since that time the cowsheds had been regularly visited, not only at the stated periods that the by-laws said that visits should be made, but also surprise visits had frequently been paid and the improvement in the cowsheds in the district had been very marked indeed. There was more cleanliness, the ventilation was very much better than it used to be; in fact the only fault he had to find was that in the by-laws they were not allowed by the Local Government Board to have any specified number of cubic feet for each cow. The by-laws stated that if the cows were turned out at some period of the day during the whole of the twelve months, then the amount of space was not to be a certain number of cubic feet. That undoubtedly was a disadvantage, because during the cold winter months the cows were turned out for perhaps a few minutes and that just complied with the by-laws, and for the rest of the twenty-four hours they were in some cases, he was afraid, very much overcrowded. That overcrowding was considered by some of the farmers to be an advantage because they thought that if they had a cowshed very hot and with heat produced by the cows being close one to another they would get more milk, and it was very difficult to convince many of them that pure air was as good for cows or cattle generally as it was for human beings. As regards the quality of the milk sold to the public the Council had for some time past allowed him at times to take samples, which had been submitted for examination for tubercle bacilli. Many samples had been taken and he was pleased to say that the samples had always been reported upon as free from tubercular bacillus. It had been rather a difficult matter to educate the farmer to the necessity of having his cowsheds well ventilated and frequently cleaned, lime-washed.

and at times sprayed with disinfectants; and it was also very difficult to impress upon him the necessity of cleaning the cows themselves. They would clean their horses; they would brush them and use the comb on them to make them fit for their work, but they never seemed to think there was any necessity to clean the cows in the same way. Undoubtedly it would be very useful if they could thoroughly imbue the farmers with the idea that it was quite, if not more, important to keep their cows clean. Sometimes, unfortunately, when a visit was paid to the farms in the milking time, it was found that the people who were milking the cows were doing so without having first washed their hands and taken the ordinary precautions necessary to keep dust and dirt away from the milk. That state of things was, he was glad to say, better than it was ten or fifteen years ago. The farmers and the men were gradually becoming educated and he thought that when the Milk Bill passed the Houses of Parliament many farmers in his district would have been so far educated that they would be ripe for it and they would not have much difficulty in getting it enforced. There was in some parts of the country districts almost as much difficulty in getting milk as there was in some parts of the large towns. He remembered visiting some cottages in the district in which he worked and he asked the occupants from whom their milk was procured, and they told him they could not get milk at all, that when they used milk at all they had to use condensed milk, and the reason was that it paid many of the farmers much better to grow potatoes, cabbages, cauliflowers, and other vegetables for the markets in the large towns, than to keep cows and produce milk. They found that many dairy farmers had been hard hit, and they knew in what direction their pecuniary interests lay—they were not exactly philanthropists. They were out, like many other people, to make money, and they were not going to produce milk at a loss if they could produce anything else which would pay them better.

Dr. S. G. MOSTYN (Darlington) said that one thing which he felt they needed in connection with the regulation of the milk supply was a definite statement of certain facts. Over and over again they heard accounts from the various farmers' associations about the peculiar way in which the standard of milk varied. He had had samples of milk taken well below the standard in fat. As soon as the report came from the analyst an appeal was made to the cow as recommended by the Board of Agriculture, and the milk obtained from the cow was excellent; and yet he had known

magistrates fail to convict. One local inspector interested in farmers' questions seemed to have on his file a list of articles saying how difficult it was to keep up a good standard of milk, and those articles were printed periodically, especially when a conviction had been obtained by a local authority. He thought they really wanted an authoritative inquiry into the condition of milk throughout the country to be made by responsible persons whose opinions would bear weight with the public and with magistrates to a greater extent than the statements that were collected and published by the farmers' associations. One of the best known analysts in London found as his experience that as soon as the statement that they might reasonably look for 3 per cent. of fat in milk was published the percentage of milk fat fell immediately to the average in the county for which he was analyst. In his (Dr. Mostyn's) own district they got an excellent fat percentage—4 per cent., $4\frac{1}{2}$ per cent., and even more—regularly, and yet when they got the fat down to perhaps $2\frac{1}{2}$ per cent., and found that a few days afterwards the same cows gave them 4 per cent., that was explained away by the advocates of the milk dealer to the satisfaction of the magistrates. He thought such a state of affairs was very unsatisfactory—they wanted something that would convince the magistrates that the statements the analysts made were trustworthy. He might say that frequently after the failure of a prosecution on technical grounds or through prejudice he had had extracts from various papers sent to him pointing out how hard it was that farmers should be treated in that way. If those statements were true they would like to have them proved, in order that they might not be unjust to the farmers. Until they had some authoritative Government statement on this matter he felt they would never solve this problem, and he was sure that was one of the most important matters in dealing with the production of a good quality milk in the towns. They were well aware that the skilful farmer without actually adding water to his milk could lower the standard, and they wanted some means of preventing the adulteration of the milk actually in the cow.

Mrs. WARE (dairy farmer of the United States) said she was a member of the American Agricultural Commission which had been prosecuting its inquiries lately in the United Kingdom, and although she knew she had no right to speak at the Conference, she felt she must ask their indulgence for a moment or two. She was very deeply interested in the whole matter under discussion, and they would understand that when she told them she was a dairy farmer herself. She was a dairy farmer outside Boston, Mass., and the

request from their dairy for a Milk Commission in Boston was what brought the Commission into existence. For the last eight years she had been working with all her powers on the subject of clean milk. She was exceedingly glad that Dr. Coit had called attention to the dairy farmer outside New York who helped with those doctors years ago in the beginning of that splendid clean milk work—the getting of certified milk which was educational, and which perhaps did its best work in the setting of the new standard. During the last three months she had had a very unusual opportunity of study. The Governor of Massachusetts appointed her as a member of the Agricultural Commission—a large body of people who had come from the States to study the question of co-operation. As a dairy farmer she had, of course, very special interest in that side, also in the medical side of the question. Beginning in Italy early in May, going as far east as Hungary and as far west as Ireland, where she had been able to see the splendid work done among the peasants and the dairy farmers by Her Excellency the Countess of Aberdeen with her own eyes. She knew whereof she spoke from the farmer's point of view, and the farmer's point of view had not been presented that day. She wanted to say with all the emphasis she could just two things. In the first place she wanted to say that in the different countries there existed a different need. They could not say of the same thing that it would fit conditions in England and conditions in the States, or in other countries—there must be flexibility of machinery underneath certain fundamental facts, and that was one matter she asked them to consider—that it was not wholly a sanitary matter. As a dairy farmer, with all the experience she had tried to get in this and other countries, she was convinced that it was also an economic question. As a dairy farmer she asked the doctors to remember that in all this programme for clean milk in all countries from the top downwards there were also farmers working from the bottom upwards, who wanted to work with the doctors. The greatest privilege they could have was to co-operate with the doctors, for they realized that this work was one which was very closely associated with the health of the people. They asked for that privilege, and in this great combination which was going on all over the country they asked the leadership of the doctors. If the public were to be educated it certainly was the doctors to whom the farmers and the women workers must appeal. It was not alone a question of health; it was also a question of economics, and if the dairy people were to live there were questions of dairy economics and of medical economics

which would have to be considered, and it was for the doctors to tell them carefully and in detail many things relating to milk; but on the side of economics she asked the doctors to believe that the farmers had studied that most carefully. It was not for them as farmers to decide what should be the minimum or the maximum that physicians should charge for a consultation that might save the life of a child. Was it wholly for the doctors to decide what it cost to produce that milk which might also, with the doctor's help, save the life of a child? All she asked was that they might have co-operation—that the doctors would allow them as farmers to work under their leadership, because they could trust the sanity, the sureness, the cleverness of that leadership, and also the great human side which had come out over and over again both in the towns and in the cities.

Dr. W. PERRIN NORRIS (Commonwealth of Australia) said he had not intended taking any part in the discussion, but for the speech of his medical confrère from Darlington, who had told them a story about unsympathetic Benches and of Benches that were on the side of the adulterators. He thought it might not be out of place if he told them a little experience he had had in this regard. A Pure Food Law was enacted in Victoria in 1905, and among other things power was obtained to frame regulations standardizing articles of food. Some were prepared to place this power in the hands of the Board of Public Health, partly a municipal body, but he had advised that this should not be a matter wholly in such a Board's hands, and as a result Parliament framed the law on the basis that the question should be dealt with first of all from the scientific standpoint; secondly, from the standpoint of efficient administration; and thirdly, from the standpoint of the honest manufacturer. After the law was passed the time came to formulate food standards, that for milk among others. The officers of the Health Department were sent into the highways and byways to obtain samples from milk vendors, they sampled the milk at railway station depôts, where wholesale market milk was delivered. In all, the results of about 20,000 to 30,000 samples were available from which to judge what the standard should be. It was found that the lowest fat content was 3·3 per cent., and this in very few samples: the average was nearer 3·8 per cent., and the standard was fixed at 3·5 per cent. fat, 12 per cent. total solids. This was in 1906, and the standard still remains at these figures. There has been an outcry in the press each spring, as well as letters from the Retail Milk Producers' Association, pleading that they

cannot comply with the standard. Fortunately there is also a Wholesale Milk Producers' Association, and it replied with an official letter stating that the producers could supply milk up to the standard fixed by law. As a result the opposition has given out, and the people are getting better milk. A low standard is an invitation to adulteration and sophistication, watering or skimming. No honest milk producer need fear such a law, because the appeal to the cow could be resorted to if necessary. Personally, he thought it would be well if farmers, public health authorities, and others to-day looked upon milk as a product of human art instead of as a mere product of Nature—of course he did not mean a product of the adulterator's art; what he referred to was the fact that artificial selection had practically entirely replaced natural selection in the case of the domestic animals. As a consequence, the quality of the milk, like the quantity, was largely determined by human action. Men would breed cows for poor milk if a low standard were fixed. They would not cull their herds. It had to be remembered that feeding had relatively little effect on the quality of milk. The rule should be to breed for quality and feed for quantity of milk. If widespread and proper sampling of milk were carried out in this country it would probably prove practicable to approach the Government with irrefutable data, justifying a standard of at least 3·3 per cent. of fatty solids; perhaps they might see their way to a 3·5 per cent. standard.

Mr. ROBERT LAMBIE (Lanarkshire) said he was delighted with the remarks of the last speaker, because he believed that if local authorities exercised the powers they at present possessed they would have better milk both as regarded quality and quantity. Local authorities had the power to give technical and scientific education, and the man who wanted to take the most out of the land in the days that were to come must be a scientist, and a scientist of no mean order, and they as members of local authorities had the power to place that knowledge within his reach, and it was their duty as local authorities to do so. He was one of those who believed that the farmer should be held responsible for the quality of the milk that he supplied the market with. The farmer should be held responsible both for the purity and the quality of the milk he sold, and if he took advantage of the scientific knowledge that was placed within his reach, and that they as local authorities were bound to place within his reach if they carried out the duties that the law had entrusted to them, then the quality and the purity of the milk as far as the farmer was concerned rested with

him. Recently he was speaking to a farmer who twenty years ago derided the idea of scientific knowledge for farming. Some of them, however, persuaded him to take up the scientific side of the question, and the testimony of that farmer to-day was that such knowledge had been a benefit to him all along the line, and that the man who wanted to do farming in a paying way must have scientific knowledge. There was nothing that would so well repay any labour spent upon it as the land, if only the labour were spent in a proper manner. His (the speaker's) point was that local authorities had the power to place scientific knowledge within the reach of all the farmers in their various districts, and if they did their duty, then there would be no blame attaching to the local authorities. His next point was that they should make the farmer directly responsible for the quality of his milk. He was one of those who believed in one responsibility. The farmer was the responsible man, and if he (Mr. Lambie) were a dairyman distributing milk then he would get a guarantee from the farmer. They got guarantees in regard to other forms of food that it was pure, and if he (the speaker) was a scientific farmer and knew his business he would have no difficulty in giving a guarantee that his milk was pure, and if any dairyman did not get that guarantee, make him responsible for distributing the milk if it were adulterated. He held that the local authority where the farms were situated, and where the milk was actually produced, was the only authority that could properly deal with this matter. He would go a stage further, and would say that if a local authority had got impure milk or poor milk in its locality, they ought to prosecute the local authority from whose district it came. One of the speakers had spoken about getting a milk supply, in the same way as the people were now supplied with water; but we were a long way from that state of things yet. That time might come, but as local authorities their duty was to exercise the powers which they now possessed. They were faced with the responsibility. As local authorities elected to do the best for the people whom they represented, they had taken upon themselves that responsibility, and if they did not exercise those powers to the best of their ability then they were not doing what they had taken upon themselves to do. If that were done all over the country he had no doubt about the quality of the milk supply. The standard suggested by Dr. Norris was none too high. His (the speaker's) scientific farmer friend said that if they took the milk as it was produced they would have no difficulty in such a standard. They wanted to place the responsibility

upon the right shoulders. The man that sold margarine for butter knew what he was doing, and the man who sold impure milk also knew what he was doing. One of the cruellest things in the world was that men who knew (and the farmer did know) should be selling milk which was not what it should be. They wanted the best of everything for their people, and farming in the future, he believed, had got to be a job for the scientist, for the man who understood the nature of the soil and its different chemical properties, and who would be able to know that what would do in one part of the country would not do in another. As members of local authorities they had the power to make man perfect in his education, whatever class of work he wanted to perform, and having done that they should demand the best.

Mr. G. E. BROWN (Staffordshire County Council) said that he just wanted to say one or two words from the standpoint of the ratepayer. He was not there to ask for indulgence for the ratepayer at the expense of the health of the community, but at the same time he was a sufficiently interested person to be considered, and particularly when some of them went before him every three years. (Laughter.) He had read Dr. Hope's paper, in which he referred to the expense of producing milk—that was that it must be produced as cheaply as possible so that the consumer should be able to get it at the lowest possible price. If it were to be produced cheaply and under proper conditions, it was only fair that those people who benefited most by having a pure milk supply should bear their share of the cost of getting it pure equally with those who produced it. He would like to put it in this way. The county councils had had thrust upon them the Tuberculosis Order. In their county at this present moment if they did their duty they would slaughter 4,000 animals at once, but they had not the money to do it with, and it was not fair to ask the farmers in their county to provide the money for that purpose. That was an Order for the benefit of the people in the towns as well as for those in the country, and if the Government put on them these duties they should provide them with the money to carry out the work. He was not one who advocated going to the Exchequer for every penny that they wanted. He knew perfectly well that local authorities would be extravagant if the Government provided all the money that they needed, but for those purposes which were for the benefit of the whole community surely the cost should be provided out of the Exchequer? They had been promised a Milk Bill, and he looked forward to the Milk Bill, but that measure was to be administered by the county authorities. County councils

in many instances were composed of 75 per cent. of farmers and those interested in agriculture. If it were going to cause these people to put their hands in their own pockets, if they were going to provide the money which the Bill was going to cost, how could they expect them to administer the Act, if it should become an Act, in anything like the spirit in which it ought to be administered? He ventured to say that they might pass as many Milk Bills as they liked, but if they were going to put more expense on the agriculturist, he would administer it as niggardly as he possibly could, and he would administer it in his own interests. He appealed to any person at the Conference who had influence with the Government in regard to the Milk Bill that they should see to it that any expense that was caused should be borne equally by the people who lived in the towns as well as those who lived in the country districts. That question had come before their public health authority only this last year. His point was that it was more in the interests of the people of the city to whom the milk was going that their milk should be pure than it was in the interests of the people who were supplying the milk, and therefore he did not think it was too much to ask that the people who demanded a pure milk supply should be asked to bear their proper share of the cost of supplying that milk to the community.

Dr. H. L. K. SHAW (New York) said he would like to inform the Conference that he had just received a special bulletin, issued by the State Department of Health of New York, describing what was being done in several of the smaller States in regard to the milk question. He had about 300 copies for distribution, and would be pleased to give a copy to any of the delegates who would like one. He merely wished to add that in his view the question was an economic one, and they wanted to start at the bottom and educate the farmer. They wanted to have a system of milk inspection that should not be arbitrary in its methods. They wanted to try and show the farmer where he was making his mistakes—to educate him and try to get him up to the standard they all desired. The problem in England was a different one to the problem in the United States. The conditions of the farms here were absolutely different to what they were in the States, and he could see at once that the methods they had employed in the United States could not be used in this country. What they really wanted to do was to make a friend of the farmer and not to treat him as an enemy. In one of the small towns in Albany about three weeks ago the health officer called a meeting of all the farmers and dairymen supplying milk to that little town of

10,000 inhabitants. He brought with him a member of the State Department of Agriculture, who gave an address to the farmers, telling them how they could improve their methods of dairying, and the farmers in the district were now going to get together to improve the conditions under which they carried on their work. The farmer wanted to do right, and the medical officer wanted to assist him, and the two working together was, he was convinced, the way in which progress would be made.

Dr. R. SIDNEY MARSDEN (Birkenhead) said that a great deal of what he had intended to say had already been said, and therefore he would not repeat it. There was, however, one thing he wanted to say, and that was that he hoped the Conference would not fall in with the suggestion of the lady from Manchester that the milk supply should be municipalized. It was essentially a retail business, and ought to be kept as it was, under control. The conditions under which this country was supplied with milk were steadily and gradually improving, and he thought they might say that the conditions were improving as rapidly as could reasonably be expected considering the economic difficulties. He wanted to ask Dr. Hope one question—how best could they improve an infected milk supply? In Liverpool they were trying a new scheme of sterilization by electricity. He would like to ask Dr. Hope whether he could tell them whether such sterilization affected the nutritive value of the milk, for that was a very important point. To kill a germ was not like electrocuting an individual who was killed by nervous shock. In this case they were making some chemical change in the milk cell, and he would like to know if Dr. Hope could tell them whether that change lessened the nutritive value of the milk.

Dr. E. W. HOPE (Liverpool) said he might at once reply to the question of Dr. Marsden. There was no change whatever in the quality of the milk so far as the most careful observation by chemical tests, &c., went, and the feeding of large numbers of kittens showed that they flourished, if anything, rather more on the electrically sterilized milk than on ordinary milk.

Dr. T. J. CLARKE (Malay States) said he had been rather disappointed at not hearing anything except that which related to the milk supplies of large cities. In the country he came from they had one or two fairly large cities, but a very large proportion of the population was in smaller towns. Measures which could be adopted in large cities were extremely difficult to adopt in those towns which he had in his mind. They had no tuberculosis in any domestic animal in the Malay States, and they had no surgical

tuberculosis, so that with them the whole problem was simply one of delivering clean milk to the people in order to avoid diarrhoea, dysentery, &c. They could manage it in the towns. In the town of Ebo, a town of about 25,000 people, they did not allow any milk seller to sell milk unless he was licensed. The licence was called a permit, and was freely given. No milk seller was given a licence unless he milked in the municipal dairy. The municipal dairy delivered sterilized vessels, into which he milked either his cows or his buffaloes. After the milk was in the buckets it was passed through a strainer which had also been sterilized, after which the milk was passed into pint bottles, which were sealed in such a way that they could only be opened by breaking the seal. Buffalo milk was put into tins which were sealed by a piece of string in which there were no knots. A knot on the string was a sure sign that it had been condemned. In that way they delivered a perfectly pure milk in Ebo, but they still had the problem, and he was hoping to have heard some solution of it that morning as to how they could deliver pure milk to their smaller communities which, as he had said, represented about half the total population.

The CHAIRMAN said that so far in the discussion nobody had mentioned one plan which she saw at Toronto last year and which had been in force there for about eighteen months. With the object of securing in the first place clean milk at all the railways, inspectors went with a little measure and took samples of the milk. They forced the milk through a little disc to show how much dirt, if any, there was in the milk, and if the dirt on the disc amounted to a certain quantity then the cans were sent back from the station to the farmers. They were labelled with a big red label and a little cochineal was put into the milk so that it could not be sold again. It did not hurt the milk and it could be given to pigs, but Dr. Hastings, the medical officer of health there, had told her that that had had a great effect in stimulating the supply of a clean milk because the farmers disliked nothing more than seeing their cans come back to them with the big red label on. The health authorities in Toronto asked the dairy farmers if they would like to have visits from the inspectors with a view to entering into competition. There were various marks given for the milk and the inspectors visited the farms and the names of those who came out best were exhibited in the City Hall. That again, she was informed, had had a very considerable effect in inducing the farmers to look more carefully after their milk. In addition to that, they took samples of the milk for examination from the point

of view of fat, &c. She might say that the little discs which the inspectors used were kept in the City Hall in albums, plainly showing the dirt on them, and if any farmer came and complained because his milk was sent back he was shown the disc which was taken from the can.

Mrs. J. KINGSWELL (Portsmouth) said she wanted to ask whether any of the doctors present could tell her whether in the event of a mother being unable to suckle her children they should be given pure milk as it came from the cow or whether it should be diluted.

Dr. CHALMERS (Glasgow) said that personally he had been hoping that some medical man who was practising would answer that question, but, failing anyone else, he would like to say that in his view it was well to dilute cow's milk for the feeding of infants, not because there was too much fat in it, but because it contained too much glucose. In the text-books they found the advice that very young children should be fed with two parts of water to one of milk, with cream added to make up the deficiency in the fat. That recommendation still held, but Mrs. Kingswell was perfectly right in saying that now and again they got children who did very well indeed on pure milk, and that raised another question entirely. Speaking broadly, he did not think it would be good advice generally to recommend that babies be fed on whole milk, although it undoubtedly was a fact that some babies under given conditions would do well on it.

Mr. BROADBENT (Huddersfield) said he did not think they would like to separate without giving an expression of thanks to the Countess of Aberdeen for the grace with which she had presided over their deliberations that morning, and more particularly for the most interesting address which Her Excellency gave them with regard to the supply of milk in the rural districts in Ireland. (Hear, hear.) He would look forward with the greatest pleasure and interest to the report to which Her Excellency had referred, because the lack of milk in rural districts was one of the growing evils all over our own country and they would all be interested in learning the result of the careful observations which had been made in Ireland in this connection. In this way Ireland was leading, as it had led in the matter of the crusade against consumption, and if Ireland could teach them any lessons in this respect it would but add another debt of obligation to the many which they owed to Lady Aberdeen for what she had done already in the direction of health culture.

The meeting then terminated.

MEDICAL SECTION.**FIRST SESSION, AUGUST 4.**

The first session of the Medical Section was held under the Presidency of the Rt. Hon. J. PEASE, M.P. (President of the Board of Education).

CHAIRMAN'S ADDRESS.

The Rt. Hon. JOSEPH PEASE, M.P., said: Ladies and Gentlemen,—You have listened to a speech by the President of the Local Government Board, as naturally questions connected with hygiene and sanitation come under his Department. We of the Board of Education realize that the physical conditions of the people are the essential preliminary to the imparting of education, and that therefore we are closely associated with anything which is calculated to diminish the rate of infantile mortality or to promote a healthier condition in the children of the country for whose education we are directly or indirectly responsible. To-day I intend, in presiding over this section, to make my remarks as short as I can, as we have a large number of papers to discuss. But might I just reciprocate the kind sentiment of greeting which has been expressed by some of our colleagues from over the seas at the meeting in the large hall? May I also express to those who are about to read the papers our sense of indebtedness to them for so kindly sharing their opinions with us, which they have obtained after much study and prolonged experience, and which they have taken great trouble in preparing so that they can be placed before us for the benefit of the Congress and for the benefit of the human race as a whole? I represent in the educational world the Government in so far as education is concerned in England and Wales. We have to realize that during the last few years there has been a considerable reduction in the rate of infant mortality—from 145 per thousand in 1902 to 95 per thousand in the year which has just passed. Well, the decrease has been attributable to two causes—perhaps some slight improvement in the physical condition of child-bearing mothers, but more, I believe, to better infant care and management. Ignorance is at the root of a great deal of preventible infant mortality, and that is where education comes in. We at the Board of Education have endeavoured to disseminate information through the schools. We do what we can to create a healthy public opinion, and we have done what we can also to encourage schools for mothers, and I am glad

to say that we have now 230 of these institutions in our country which are doing most beneficial work. We are also endeavouring through the schoolmasters, through the directors of education, and through the local education authorities, to interest the whole of the rising generation in this subject in perhaps the best possible form. I have here a circular, of which I may be allowed to read, perhaps, three paragraphs, which we have issued to all the local education authorities: "The Board are anxious to direct the attention of members of local education authorities, of managers, and of teachers of public elementary schools throughout England and Wales to the great importance of increasing and improving the present inadequate provision in our schools for instructing girls in the care and management of infants. . . . If girls and women could be taught how to take care of infants we might hope to diminish not only the high rate of infant mortality, but also the large amount of unnecessary ill-health and physical suffering caused by neglect in infancy and childhood. Education is concerned with the bodies as well as the minds of the scholars, and a practical knowledge of the common conditions which affect health and physical efficiency is as necessary a part of the purposes of a school education as intellectual attainment. Some such teaching ought certainly to be provided for girls by the local education authority." And we end our circular to all these school authorities throughout England and Wales in these words: "This teaching in infant management should be available for all girls during their last year (at least) in the elementary schools. Girls who are dull and backward in their ordinary school lessons will often respond to teaching of this kind in a remarkable way, and thus not only will they enjoy and profit by the lesson itself, but the mere fact of discovering that in this respect they are equal to, or even better than, girls whom they have been accustomed to regard as superior to them in all ways, will frequently exert a most happy and beneficial effect upon their general intelligence. They will learn, with their brighter comrades, that intellectual attainment is not the only issue of true education, and that in learning the art and practice of infant care they are helping to secure for themselves their true place in the future of the State." Well, I wish, if I may, in conclusion, to pay my tribute to the voluntary workers of this country who help our education authorities. It is mainly done by women who are not seeking any notoriety for themselves, but for love of the children become members of after-care committees in connection with

our medical service which is rendered in the elementary schools, and who undertake to visit the homes where the children come from who attend our schools, and in that way give practical advice to mothers who, I believe, are only too willing to learn if they are approached in a proper and respectful way. In conclusion, may I say that I have been anxious in the short time that I have been at the Board of Education to do what I can to help to institute schools for mothers by giving the most liberal interpretation I can to our technical regulations which allow us to give grants to these schools? I hope next year that such institutions as crèches, nursery schools, and schools for mothers may be further assisted by the State in the National Education system which I hope then to be permitted to propose. Finally, I desire to welcome all those who are taking part in this particular section, and I may say, after reading the papers which I have been privileged to see in advance, that I do feel that this Conference will accomplish a great work in the future by stimulating public opinion outside, by promoting a reduction in infantile mortality, and by bringing into existence a more virile race of which future generations may well be proud.

THE NECESSITY FOR SPECIAL EDUCATION IN INFANT HYGIENE, WITH PARTICULAR REFERENCE TO THE MEDICAL PROFESSION.

By LINNÆUS EDFORD LA FÉTRA, A.B., M.D.,
OF NEW YORK.

Associate in Diseases of Children, Columbia University; Visiting Physician, Pediatrics Department, Bellevue Hospital.

SPECIAL education in infant hygiene is a necessity, because, in the first place, the mortality among infants and young children is higher than at any other period of life. More than one quarter of the total deaths of the community occur in children under the age of 3 years. Twenty-five per cent. of infants born alive die during the first year, 7 per cent. more during the second year, and 3 per cent. more during the third year; so that of 100 newborn babies more than thirty-three will be dead, under ordinary conditions,

by the end of the third year. This is bad enough, for even an old man of 84 years has a better chance of living another week than has the newly born infant. But if we should add to these deaths the 5 per cent. stillborn, and the more than 20 per cent. of pregnancies that result in miscarriages, the figures of infant loss are simply astounding.

Instruction in infant hygiene will save babies' lives by lessening infant deaths.

A second reason for special education in infant hygiene is that the public needs and demands physicians who are well instructed in the care of babies.

In this connection must be mentioned the need of nurses trained in infant hygiene. There is an immense and growing demand for such nurses. A wave of interest in social welfare work is now spreading over the whole civilized world, and now in the United States almost every small town has its social service bureau with one or more district nurses. The principal work of the nurses relates to childbirth and infancy, including the diseases of childhood. The weakest link in this chain of philanthropy is the dearth of women sufficiently experienced in infant feeding and hygiene. Facilities must be provided for educating such women, and physicians must give this instruction.

What are the topics that should be included in such a course? An answer to this question may perhaps best be reached by first enumerating the problems to be attacked. We have, first, an enormous mortality before the normal time of birth, due to miscarriages, prematurity and stillbirths. An investigation made in Philadelphia showed that in 1911 there were 39,975 babies born; of these 2,131, or about 5 per cent., were stillborn. There were also 559 premature births in which the baby died, and there were during the same year 10,666 miscarriages. This means 13,000 dead among about 50,000

pregnancies, or over 25 per cent. Just think of the blasting of hopes, the discouragement of womanly effort, these figures imply! Something must be done to prevent this enormous loss of life before its portals are fully entered.

Secondly, we have a very large mortality during the first few days and weeks of life. The Health Officer of Washington has stated that in 1911, out of 957 deaths in the first year of life, 151 occurred on the first day, 130 between the first and seventh days, and 114 between the seventh and the thirty-first days; that is, 395, or about 40 per cent. of the deaths of the first year, occurred during the first month and about one-sixth on the first day. These figures were not exceptional, for in 1910, out of 1,070 deaths, 150 occurred on the first day, and in 1909 out of 1,042 deaths 140 occurred on the first day. So we can set down one-sixth of the mortality of the first year as occurring on the first day, and almost one-third of the first year mortality as occurring during the first week. This first week's mortality is not due to the milk or to the manner of feeding, but to earlier acting causes, such as hereditary weakness or disease, malformations, difficult or mismanaged childbirth and septic infection.

Thirdly, we have a large mortality during the remainder of the first year. This is due to difficulties with nutrition and to infections, particularly to gastrointestinal and respiratory diseases. Along with this mortality there goes, of course, a morbidity which is preventible to a large degree. A few statistics are of interest in this connection.

Of 10,000 infants nursed at the breast, there died during the first year of life 580; of 10,000 artificially fed babies there died 4,588, that is to say, the breast-fed baby *has about nine times as many chances for life as has the baby artificially fed.* This is the most important fact with reference to mortality and morbidity during the first year of life, that over 85 per

cent. of the mortality occurs in babies that are artificially fed. Manifestly the most important factor in baby saving is to have the baby nursed by its own mother.

What measures must be taken to combat this waste of infant lives? To prevent the enormous premature mortality we must not only endeavour to bring about in the community the knowledge and the application of the findings of the new science of Eugenics or Racial Hygiene, but there must be pre-natal care of the mother by the physician and nurse, with assistance from the State if necessary to prevent overwork and under-nourishment. There must also be instruction of expectant mothers and of growing girls.

To reduce the mortality and morbidity of the first year the primary consideration is maternal nursing, though properly modified milk constantly adapted to the baby's needs serve as a good substitute when breast milk is not obtainable. Nursing by the mother is almost always possible if proper care and encouragement are given to the expectant mother. In an experiment made by Dr. Schwarz in New York it was found that, among 1,501 cases, 96 per cent. of the mothers could be taught to nurse their babies for one month or less; 88 per cent. nursed their babies for three months, and 77 per cent. for six months. How much this means! For every drop of breast-milk helps not only to nourish the baby but to develop and increase its digestive capacity for other milk or foods.

In order to promote nursing, preliminary care of the nipples is frequently necessary, and to prolong the nursing the mother's comfort should be considered, especially as regards her sleep at night. This can be done by making the nursing periods regular, and at least three hours apart by day, with only one feeding at night; moreover, after three months an occasional bottle-feeding may be given.

Every physician should appreciate the importance and understand the technique of maintaining breast-feeding as long as possible.

For the premature and feeble infants breast milk is almost a necessity, and can usually be obtained from maternity hospitals, or from the wet nurse agencies that are now being established. Artificial feeding, even with the best modifications of milk, can be regarded only as a second choice; it succeeds well when constantly and carefully supervised.

Important adjuvants to proper nourishment—more important with babies that are bottle-fed—are the matters of proper housing, ventilation, clothing, rest, exercise and airing, bathing, and protection from infection. In this connection it is interesting to recall that Prausnitz, investigating the influence of the living conditions upon the occurrence of gastro-intestinal disease, found that, in Graz, not a single child of rich parents died in the five years investigated; during the same period, of those in moderate circumstances, 4 per cent. died of gastro-intestinal disease, of the poor 36 per cent. died, and of the destitute 60 per cent. died.

Analogous results were found in the four other cities and indicate the influence of the home conditions, feeding and care.

From what has been said, it is manifest, I think, that special education in infant hygiene is needed, and it is also evident that this matter is primarily one for the medical profession rather than for the Government or philanthropic agencies. What can and should the medical profession do? The answer is, establish in every medical school a separate department of pædiatrics commensurate in importance with the importance of this subject, and include in the curriculum a special course on infant hygiene.

On the Continent pædiatrics has long been recognized as a speciality. Not only have special journals

for children's diseases been published for several decades, but the medical faculties have had special departments with full professors of pædiatrics and special hospitals for teaching and research. Among the new University Hospital buildings in Vienna, the children's clinic occupies as prominent a position, and, with its contagious pavilions, covers more ground than the new medical clinic.

In considering the subject of infant hygiene, just as in dealing with the baby, we cannot separate the baby from the mother without doing harm, so there should be the closest co-operation between the departments of obstetrics and pædiatrics. That part of the course dealing with pre-natal care and the prevention of mortality during childbirth might well be given by the department of obstetrics. In addition to lectures, the instruction should include visits to properly conducted maternity services, infants' consultations or milk stations, dairies and milk laboratories as well as infants' hospitals. There should also be installed a small model or miniature exhibit, showing what is bad as well as what is good for the mother and the baby, with especial reference to the living-room or nursery, and its ventilation, the baby's crib, clothing, care of the milk and bottles, table for food preparation, arrangements for bathing, for fresh air, &c. The greatest amount of time and effort should be devoted to the subject of infant feeding, with emphasis on maternal nursing.

The chief consideration is that every student should have indelibly impressed upon his mind the influence upon infant life and infant health of the following:—

(1) Heredity.—The teachings of eugenics as regards parenthood, with special reference to insanity, alcoholism, tuberculosis, syphilis and gonococcus infection; discussion of measures advisable. Fitness for marriage; school instruction in sex hygiene;

"little mothers'" classes. The co-operation of the clergy might be secured by their attendance at these lectures.

(2) Pre-natal Care.—Occupation, exercise, diet; preparation of breasts for nursing. Assistance by the State.

(3) Childbirth.—Prevention of obstetrical deaths and of sepsis in mother and babe; prevention of blindness; the question of midwives; advantages of birth registration.

(4) Special care of premature and feeble infants.

(5) Infant Feeding.—General principles; breast milk and advantages of maternal nursing; promotion of maternal nursing; aids for nursing mothers; wet nurses; management of illegitimates and foundlings.

(6) Weaning.—Indications for, and advantages of, gradual weaning; treatment of indigestion in nurslings.

(7) Artificial Feeding.—Principles; cow's milk, its production and care; pasteurization and boiling, their effects and uses; modified cow's milk, its advantages over patent foods; usefulness of patent foods in special conditions; treatment of diarrhœa in bottle-fed infants.

(8) Normal Development in Infancy.—Weight, teething, muscular co-ordination, mental development.

(9) Hygiene of the Baby.—Bathing, clothing, airing, "hardening," sleep, exercise, rest.

(10) Hygiene of the Nursery.—Crib, perambulator, bottles; nipples and preparation of food.

(11) Prevention of Infection.—"Colds," diarrhœa, contagious exanthemata, whooping-cough and tuberculosis.

(12) Agencies for infant care and child help, correlation of; needs in the campaign against infant morbidity.

In closing I will simply reiterate that, in matters of hygiene, what is best for the baby is best for the race.

DISCUSSION.

Dr. F. TRUBY KING (New Zealand) said he was sure they all greatly appreciated the paper which Dr. La Fétra had read. As a matter of fact, he regarded it as a great privilege to have heard him because personally he had derived more benefit from the *Archives of Pædiatrics*, which he edited, than from any other journal in the world; and he thought they all in the medical profession would be willing to admit that it was the most informative and best journal appearing on the question of women and children, without prejudice to any other. As to the question of criticism, he was afraid that Dr. La Fétra had left them practically nothing to criticize. They must all assent to the proposition which he had put before them. He was particularly gratified to hear the definite pronouncements with regard to such matters as the necessity for the rational modification of milk if it was to be used for the food of a child. The emphasis which the author applied to breast feeding and the definite pronouncement he gave them that the child should not be fed more than every three hours, and his hint that probably it was best not to feed it at night, they would agree with. On the last point he might say he felt somewhat dogmatic, and he would say absolutely that the child should not be fed at night. But taking the whole paper he found practically nothing to criticize. There was one question he would like to ask Dr. La Fétra. One entirely agreed that the universal need was for more capable trained women to advise mothers. At the Antipodes they could place any number of nurses. They were enormously appreciated, and he had no doubt that in the near future this would be the most important element in raising the standard of health amongst women and children. But when Dr. La Fétra spoke of the dearth of nurses in this direction and the need of well-trained women as district nurses in connection with the care of the mother and child, he would like to ask whether it was recognized generally that for services in this direction it was necessary that the nurses should be cut off from ordinary district nursing where they had to attend people who were sick. He might say that when they had tried to combine what was ordinarily called district nursing with health education as regards mother and child they had found that invariably the nurse's attention had become centred upon the urgent cases of the sick and that practically little time would be found for the care of the mother and child, who were at the time healthy and did not seem to have any pressing call. But the very gist of the whole thing was that the nurse must devote her

whole attention to this most important matter. Then as they had been told this subject of pædiatrics should be elevated to a higher position in all universities and divorced from other chairs. He held that nurses should be separated from ordinary sick nursing because the matter of healthy motherhood was of such supreme importance that it should be her sole care and occupation. One other matter he would refer to was that of payment, and as to whether the services of the nurses he had referred to would in the States be available for mothers of all classes. The conclusion in New Zealand was that the mothers of poor children were not more in need of advice or information than the mothers of the rich children, and therefore they made the services of their nurses equally open to the mothers of all classes, and those services were given gratuitously, just as their education was free. They indeed considered this a most important plank in the programme of education, and he would like to know if that view was taken in the States, and if so how far Dr. La Fétra agreed with it.

Dr. KERLEY (New York) said it was not necessary to remind them of the necessity of lowering the rate of infant mortality as that had been done by Mr. John Burns. The point was not what they must do or what they ought to do, but how it was to be done. What was it the baby required? A baby was born into the world through no volition of its own, and it had the right to demand certain things, which indeed were very simple. These were fresh air, good food, suitable environment, and adequate clothing, and it demanded no more than any of the lower animals required. It would seem that these requirements were not of such a stupendous nature as to call for a consensus of opinion to bring about relief, yet such was the case because of the ideas which had come down to them as regards the cheapness of human life. Voluntary societies did a great deal, as they had already learned. Most of these societies, however, worked only in congested districts, which after all formed but a comparatively small part of the country; and they had towns and villages in the open country where the children were not getting adequate protection and supervision. The time was now ripe for a system of central control. What was wanted was for the various Governments to take up the matter, to establish bureaus at various points, and to help them with nurses and supervising doctors, and so get to know what each Ward of the State was doing. If that were done then the infantile mortality rate of 40 per thousand which Mr. Burns told them was the monopoly of the doctors would very soon become the general rate. They

were giving to the lower animals what they required, because they had a monetary value, but the human child had no negotiable value. A large part of the infantile mortality was due to ignorance of an extraordinary degree; no one who had not worked amongst the poor people could have any idea of the ignorance. It was only by the instruction of the mothers that a change for the better would be brought about. The care of the mothers during pregnancy was also a great necessity, and they must come under the same protective influences.

Dr. L. E. LA FÉTRA, in reply, said there was no question but that the nurse who looked after the health of the mothers and children must do that alone; otherwise, as had been stated by Dr. Truby King, the more urgent calls of the sick would take her attention away, and she would probably put off for another day what should be done immediately at the time of her visit. With regard to the point raised as to the nurses going to the homes of the rich and to those in moderate circumstances he confessed that was a problem which had not been worked out by them. They found that the very rich were well taken care of, because they could afford to pay for the services of the best physicians and nurses, and the very poor were fairly well taken care of by philanthropic societies or local visitors from the hospitals and dispensaries, but the vast number of people in moderate circumstances had not yet been reached, and that was the problem they had yet to work out. He was very glad to hear what had been done in New Zealand, and thought they would learn something of great value from the experience of that country.

THE NECESSITY FOR SPECIAL EDUCATION IN INFANT HYGIENE.

By C. PAGET LAPAGE, M.D., M.R.C.P.

Lecturer on Diseases of Children, Manchester University; Honorary Physician to the Pendlebury Children's Hospital, Manchester, and to the St. Mary's Hospital, Manchester; Honorary Consulting Physician to the Manchester Schools for Mothers and to the Princess Christian Training College, Manchester.

OUR high infantile mortality is, perhaps, one of the greatest of the evils that are attendant on modern civilization. And we have to consider not only our infantile mortality, but also our infantile morbidity. We must note that a large proportion of our infants

reach the age of one year with a weakened constitution and a lowered resistance to disease. The prevention of this morbidity in infants is almost as important as the prevention of the actual deaths.

In causing infantile morbidity and mortality, poverty has a very great effect, but I have no doubt that much can be done by education to lessen the effects of poverty and its attendant evils. Poverty usually goes with bad housing, irregular work of the father, work out of the home by the mother, and all these form a vicious cycle, one factor reacting on and producing another. Taken all together they have a very bad effect on the infant.

I should like to state here my opinion of the evil effects of bad housing and of the need that there is for remedying this. Overcrowding contributes largely to our high infantile mortality, and to my mind the only remedy for this overcrowding is the decentralization of our large works. With improved means of transit for goods this ought to be possible. Working people must live near to their work, and, if all the large works are close together, overcrowding and bad housing are inevitable. If families are crowded together in unhygienic surroundings, no education, no care, and no management can prevent an undue amount of disease; we often see efforts at teaching of hygiene almost completely nullified through want of space or appliances to carry out the lessons taught. Remedies in housing will no doubt come, and we must not relax our efforts at teaching because, whatever the housing conditions, a great deal can be done by education to lessen the effects of poverty.

In Manchester, at the Schools for Mothers, we are conducting an inquiry in two marked-out districts in which there has been previously little systematic attempt at instruction. With the help of the medical officer of health we are trying to supervise every child in each district for the first year of its life, and

by work on the usual lines of schools for mothers to reduce the infantile morbidity and mortality. So many variable factors bear on infantile mortality that it is necessary to have the accumulation of several years' evidence before one can draw conclusions from figures, but, up to the present, we have reason to believe that the teaching and visiting are having an appreciable effect on the infantile mortality in the districts. As regards the infant morbidity we get rather conflicting evidence: in one district there seems to be little, if any, connection between low wages and dirtiness in the house and bad health in the infants; but, in the other and poorer district, there is a distinct relationship between low wages and dirty homes and bad health in the infant. A woman who has a dirty and untidy house is likely to be a careless and an inefficient mother.

At the Manchester Children's Hospital Dispensary there have been 6,188 deaths in infants under two years of age during the last thirty years. I once made an analysis of the causes of these deaths, and this showed that digestive diseases give rise to a far larger proportion of deaths in infancy than do respiratory diseases, and especially so in the earlier periods of the first year of life. The analysis also showed that there is a greater amount of these digestive diseases than there used to be. This is to some extent due to the increase in summer diarrhœa, but is by no means entirely to be accounted for in this way. Now it is just in preventing these digestive disorders that education can do most.

At schools for mothers, at hospitals and in private practice, one sees an extraordinary amount of ignorance of matters relating to the care of infants, and especially so if that infant is the firstborn. We all know that anybody who possesses a valuable machine does not like it to be handled by a novice. A man who is going to buy a motor-car, if he is a novice and if

he is wise, takes practical and theoretical lessons before he tries to drive it. If he does not, he may do great damage at the beginning. By the side of the machinery of a motor-car the mechanism of a baby is delicate and intricate beyond compare, and there is the additional disadvantage that broken parts cannot be replaced. And yet many a novice mother tries her hand at caring for an infant with no more preparation than the odd bits of knowledge she has picked up.

To my mind the birthright of many of the first-born of to-day is by no means enviable, and they fully earn what rights they have, for it is often their lot to act as an object lesson for an inexperienced mother and to enable her to learn by her mistakes how to bring up her later children.

A point that strikes me most forcibly is the prevailing ignorance and helplessness if any difficulty arises in the course of breast-feeding. Far too many babies are weaned because of some difficulty in breast-feeding, and far too often this weaning is done on the advice of medical men and midwives. We do not know enough about breast-feeding and the causes that lead to variations in the power to nourish an infant, and I want to enter a plea for more scientific study and systematic instruction in this important part of infant hygiene. We owe a debt to Dr. E. Pritchard and others who have lately done so much to stimulate this study, and I hope that we shall have more articles like that by Dr. Lucy Naish in the *Lancet* of June 14, 1913.

It is the same with artificial feeding; at hospitals, and especially in private practice, the failures are far more often due to ignorance than to want of care. In many cases the mother depends on the knowledge she has picked up from the maternity nurse: such knowledge usually depends entirely on chance and a haphazard discussion of points that may arise.

The general advantages and the great success that

attend well-directed effort by schools for mothers are now clearly established, but to my mind it would be a great advantage if these schools could be extended in scope so that their influence could reach mothers in higher social scales as well. There is much need for instruction to mothers of all classes. A great deal can be learnt about infant hygiene by attending as voluntary helpers at the existing schools, but only a few of the women who really need instruction have either the time or the strength or the aptitude for such work.

Something is being done by training colleges. At the Princess Christian Training College in Manchester the period of instruction extends over eight months and is practical in nature : the pupils have the entire care of infants and young children under the supervision of trained instructors. The majority of the pupils intend to use the knowledge they have obtained as a means of earning their living, and for them the period of training is, perhaps, too short ; but, for women who wish to obtain a knowledge of infant hygiene, there is no reason why a shorter period of training should not be sufficient to teach the essential points in caring for a baby. One disadvantage of these training colleges is that they deal only with artificially-fed infants.

The teaching of girls in the elementary schools has been very successful in Manchester, and there is no doubt that a good grounding in the elementary principles of infant hygiene will be of great value to these girls in later life ; but there should be further and more practical training if possible. We all know how hard it is to study a subject efficiently without practical work and how much a baby differs from a model ; it is therefore necessary that we should have some scheme by which girls or women who are anxious to learn infant hygiene can obtain practical experience by actually looking after a baby.

At both maternity and children's hospitals more should be done; each hospital should form a centre for the spread of knowledge of infant hygiene. Budin's clinic in Paris has attained world-wide fame and many of his methods of ensuring infant hygiene could well be imitated. If necessary, visitors could be employed in suitable cases, or more use could be made of other institutions which already employ visitors. I know from experience how valuable an adjunct to hospital treatment it is to have one's efforts supplemented by the supervision and care of efficient visitors to the homes.

Finally there is room for much more teaching of those who after all have most to do with the spread of knowledge of infant hygiene—maternity nurses and medical men. At hospitals, where instruction is given to midwives, infant hygiene and infant feeding should be systematically taught. I do not say that there is no instruction at present, but my experience tells me that there is considerable room for improvement. In the same way medical students should have far more instruction than they have at present in the hygiene and care of infants. Our tendency is still to lay too much stress on disease and diseased conditions, and to neglect the teaching of the maintenance of health.

It is to the maintenance of health that our efforts should be directed, and, if I may be allowed one more word, I should like to emphasize the immense importance of periodical medical inspection during infancy and childhood, when the child is growing and developing. It does not need much experience of work at infant consultations and of school medical inspection to demonstrate this. Just as parents, if they are wise, have their children's teeth inspected periodically, apart from the development of disease, so they should have their children inspected medically at definite periods. Medical men should adapt themselves to

this periodical medical inspection and should give advice as to the maintenance of health. If these measures were generally adopted I am sure that they would have a great effect in the prevention of disease.

(There was no discussion on the paper.)

THE NEW ZEALAND SCHEME FOR PROMOTING THE HEALTH OF WOMEN AND CHILDREN.

By F. TRUBY KING, M.B., B.Sc. (PUBLIC HEALTH) EDIN.

Fittles Scholar; Member of the Psychological Association; Lecturer on Mental Diseases, Otago University; President of the Society for the Health of Women and Children, New Zealand.

"Every woman in England has, at one time or another of her life, charge of the personal health of somebody, whether child or invalid in; other words, every woman must become a nurse. . . . The knowing what are the laws of life and death for men, and what the laws of health for houses (and houses are healthy or unhealthy, mainly according to the knowledge or ignorance of the woman), are not these matters of sufficient importance and difficulty to require learning by experience and careful inquiry, just as much as any other art? They do not come by inspiration to the loving heart. . . . and terrible is the injury which has followed from such wild notions." (From "Notes on Nursing, for the Working Classes," by FLORENCE NIGHTINGALE, published half a century ago!)

THERE exists throughout New Zealand an organization known as the Society for the Health of Women and Children, which has established branches in some seventy centres. These branches are presided over by local executive committees, numbering from fifteen to thirty members each, and embrace a very large, earnest, and influential membership roll, representative of the motherhood of the Dominion.

The Society has gradually come to be looked to by all classes, and by the Government itself, as the recognized authority and referee in the

Dominion on the domestic aspect of the care and safeguarding of mother and child. The newspaper Press of the whole country has played a leading rôle in the movement, helping and encouraging us, endorsing and advocating our work and publishing at the present time some 200,000 copies of a weekly article under the heading "Our Babies' Column," supplied by the Society to fifty newspapers, and reaching practically every home in the Dominion—penetrating indeed the remotest back-blocks, beyond the reach of doctor or nurse.

The Society came into definite corporate existence only six years ago. The work was then entered into with great spirit by a committee of twenty-five earnest women in Dunedin, drawn from all creeds and classes, who felt that a stand ought to be made for rational education, help and training in the simple essentials for healthy normal motherhood and babyhood.

For about two years previous to this, some of us had been carrying on a systematic pioneering educational health mission among parents of all classes in Dunedin, by means of lectures, newspaper articles and personal visitation of homes by a specially trained nurse. The nurse was on the telephone and her services were available on application free to any mother who wanted to know how to do the best for herself and her child. The help and teaching of the nurse were soon sought by mothers of all classes, in the spirit in which they were tendered, not as a charity, but as a measure of free education in a matter of vital importance to the whole community.

From first to last main attention has been directed to the essential requirements as regards fresh air, sunlight, cleanliness, proper feeding, exercise, rest, sleep, regular habits, &c., and how to attain these in the home in the simplest and best way. As regards nutrition, we emphasize the paramount importance of breast-feeding for both mother and child; failing this

we point out the duty of parents to provide the best substitute. Mothers are taught how to modify milk in their homes in the simplest way on so-called "percentage" lines. Sugar of milk is retailed at 1s. a lb., and its use for bottle-fed babies in lieu of cane sugar has become almost universal. Feeding of babies not more than six times a day at first, and after four months only five times, is strongly advocated, and no night-feeding. The curse of "pap-feeding" and the need for hard dry food and training in mastication before the end of the first year and onwards, are insisted on.

The Society came into existence, as I have said, six years ago, to continue and extend the work which had been already established on definite lines, the leading aims and objects of the founders being defined as follows:—

AIMS AND OBJECTS OF THE SOCIETY.

(1) To uphold the sacredness of the body and the duty of health; to inculcate a lofty view of the responsibilities of maternity and the duty of every mother to fit herself for the perfect fulfilment of the natural calls of motherhood, both before and after childbirth, and especially to advocate and promote the breast-feeding of infants.

(2) To ACQUIRE accurate information and knowledge on matters affecting the health of women and children, and to DISSEMINATE such knowledge through the agency of its members, nurses, and others, by means of the natural handing on from one recipient or beneficiary to another, and by the use of such agencies as periodical meetings at members' houses or elsewhere, demonstrations, lectures, correspondence, newspaper articles, pamphlets, books, &c.

(3) To specially train and to employ qualified nurses, whose duty it will be to give sound reliable

instruction, advice, and assistance, gratis, to any member of the community desiring such services, on matters affecting the health and well-being of women, especially during pregnancy and while nursing infants, and on matters affecting the health and well-being of their children ; and also to endeavour to educate and help parents and others in a practical way in domestic hygiene in general—all these things being done with a view to conserving the health and strength of the rising generation, and rendering both mother and offspring hardy, healthy, and resistive to disease.

(4) To promote legislative reform in matters pertaining to the health of women and children.

(5) To co-operate with any present or future organizations which may be engaged in furthering the foregoing or cognate objects.

How far these aims and objects have been realized may be inferred from the account of the work and expansion of the Society contained in the Annual Report of the parent branch at Dunedin issued last April. The report shows that this one branch has a roll of contributing members numbering 650, and that it expended in the course of last year some £1,500 in the service of parenthood, yet the community doubted only six years ago whether it could support a single nurse devoted solely to the health of mother and child. This report will be supplied to anyone interested, on application to the National Association for the Prevention of Infant Mortality, at 4, Tavistock Square, London, W.C.

In the short time and space at my disposal, I can only summarize a few of the special and the leading features of our organization. The Association was started as a Society for mutual helpfulness and mutual education, with a full recognition of the fact, that so far as motherhood and babyhood were concerned, there was as much need for practical reform and "going to school" on the part of the cultured

and well-to-do, as there was on the part of the so-called "poor and ignorant."

What our New Zealand women realized was that practically none of them had had adequate practical knowledge and training for motherhood, and that this was not a class question but a universal failing of civilized communities. From end to end of New Zealand the rightness of the position taken up by the Society has been confirmed over and over again by the oft repeated remarks of the older mothers, "Oh, if we had only known when our children were babies!" while young mothers, properly directed from the first, tell us how little trouble their babies are, how much time and worry they are saved, and (in the majority of cases) how completely they can breast-feed their infants.

The committees were to embrace all creeds and classes, and they were to meet on grounds of common motherhood and humanity, without any trace or suggestion of patronage or charity. As conveyed in the second *aim* the members were first to *acquire* accurate information on matters affecting the health of women and children; and then, having arrived at what seemed best, they were expected to do all in their power to convey and *disseminate* their knowledge personally and through the various available agencies referred to.

To make clear what the Society expected of its nurses I cannot do better than quote the following passage from the printed rules, regulations and advice with which they are supplied:—

"The main function of the Society's nurses is to educate and help parents and others in a practical way in the hygiene of the home and nursery, with a view to conserving the health of the whole family, while directing special attention to the needs of mother and offspring.

"The Society is extremely anxious to bring about

a realization of the 'sufficingness' in general of obedience to the simple known laws of life and nature for maintaining the health of mother and child, and the inevitable Nemesis which follows sooner or later on any evasion of duty in this respect.

"Above all, the Society desires to avoid the resorting to anything savouring of mystery, or suggestive of special knowledge or powers outside the range or understanding of ordinary men and women. The aim should always be to stimulate and quicken the interest and self-reliance of parents in matters pertaining to the home, so that it may be regulated in a simple, sensible, and responsible way, consistent with what is known at the present time as to the fundamental requirements of life.

"The Society's work is essentially a Health Mission. In regard to domestic hygiene, its trained nurses should take the place of untrained, unskilled neighbours or relations in as tactful a way as possible."

Owing to the fact that the movement did not come into sudden existence, the Society being formed to carry on a pre-existing work which had proved successful, the members did not have to look about them for sources of reliable, consistent information on matters affecting the health of women and children. They accepted in lieu of text-book the pioneering printed sheets, giving simple necessary directions and advice, which we had already published in some of the leading newspapers of the colony. These sheets soon gave place to a small book, "Feeding and Care of Baby," of which some 20,000 copies have been issued during the five years, and of which a further enlarged edition of 20,000 copies is now being published.

Shortly before I left New Zealand, I was asked to write a Government pamphlet in harmony with the Society's recommendations, for issue by the Public

Health Department to all mothers within a few days after childbirth. Thirty thousand copies of this, in the form of an illustrated brochure of some fifty pages, entitled "Baby's First Month," costing some hundreds of pounds, were struck off as a first issue. It may be assumed that this will represent the annual output, as our births number some 25,000 a year, and expectant mothers will be encouraged to obtain and study the pamphlet, rather than await its receipt in ordinary course through the post after notification of birth.

Presently we purpose issuing a third pamphlet—logically the first of the series—especially addressed to expectant mothers. The second period (from birth to the end of the first month) will be covered by "Baby's First Month"; while the whole period of motherhood and infancy is dealt with broadly and in detail in "Feeding and Care of Baby."

For the sake of continuity, and to prevent unnecessary repetition, these three publications will contain cross references from one to the other. Further, we are constantly referring parents to our fixed publications in dealing with questions answered in the weekly "Our Babies" newspaper column, which is read almost universally by mothers throughout the Dominion.

I submit that a consistent series of authoritative pamphlets and newspaper articles on the above lines is much more effective and helpful than any single book covering the whole ground could be. The young married woman or expectant mother wants to know what she ought to be doing to-day, to-morrow, or next week; not what she may possibly have to be thinking about six months or a year or so hence. Thus, for the husband and the lying-in mother, there are a series of practical, economic, and other considerations, of vital importance, which apply almost solely to the month following childbirth, and these should be clearly set forth, unhampered by matters

which have no relevancy whatever to this momentous epoch.

We can best attain to clear thinking, and sensible conduct and habits, on the part of parents, by concentrating attention on the more urgent necessities of the moment, and of the time immediately ahead. This we effect partly through the agency of specially trained nurses and members of the Society, and partly by means of printed matter, lectures, &c.

Having once gained the interest of the mother, and won her confidence by manifest benefits accruing to herself and her child through obedience to the simple laws and needs of life—having attained so much, experience has shown us that parents (particularly men) will read and follow with absorbing interest whatever one chooses to set before them. Indeed, interest in national bodily fitness and public health can be attained only through natural unselfish love of children and devotion to their welfare. We find that the average man or woman, appealed to, reasoned with, and trained in the right way, will do anything for the health and well-being of offspring, though they may be almost absolutely indifferent as to their own physical fitness, until they have been brought to see personal health in the light of a duty and trust—to see it as something which always, directly or indirectly, benefits others, and to see ill-health and disease, not only as a curse and blight to the family, but as something unworthy and utterly unpatriotic in its tendencies. As Stevens of Ladysmith said, the very children “ought to be taught that sickness is a badge of inferiority; that to be healthy is the prime condition of all things desirable in life. Such an education might be trusted to breed healthy bodies controlled by healthy minds.” In other words, rear and train our children properly and our grown men and women may be trusted to look after themselves.

THE KARITANE HARRIS HOSPITAL.

Within a few months of the foundation of the Society a hospital devoted to babies—the first in Australasia—was established.

Starting with a few local babies this institution now receives infants from all parts of the Dominion. When I left New Zealand there were twenty-four inmates under care, viz. : twenty-one babies and three mothers.

In one sense the healing of sick babies is the least important aspect of our hospital work. The institution is a school for mothers, an ever open object-lesson, by means of which some thousands of visitors of all classes see and are taught personally every year the essentials for healthy motherhood and babyhood, while mothers who have any trouble with their babies, are encouraged to become inmates for a week or ten days, so that they may be set on the right track.

Most women on returning to their homes become centres of light and leading for their friends and neighbours ; thus health reform spreads from home to home and from district to district.

Not only is the hospital held available for the teaching of actual mothers, but we encourage potential mothers—girls in their teens and expectant mothers—to attend weekly lessons and demonstrations, or to enter the institution for a short course of training. Further, a guild of sixty girls was organized some years ago, each to spend an afternoon once a month handling and looking after the babies in the grounds, thus helping to provide the “mothering” element, apt to be lacking in institutions, and at the same time implanting and developing motherly tendencies and aptitudes in the girls themselves.

Last, but not least, the Karitane Harris Hospital is used by the university as the institution for the practical and clinical teaching of pædiatrics to our

medical students, and by Miss Boyes Smith, the Professor of Domestic Science, for teaching her students this aspect of their work.

We were fortunate in securing several acres of beautifully planted old grounds for our institution, but the buildings from first to last have been the simplest and most homelike imaginable. Indeed, for some years our nurses had to be accommodated in a wooden stable modified on very primitive lines, and the hospital itself was an ordinary colonial wooden cottage, good enough for anyone so far as sunshine, fresh air, &c., were concerned, but containing practically nothing outside the range of the humblest cottager. Costly elaborate buildings would have been the reverse of an advantage, and we were more than gratified when Mr. Wolf Harris, of Queen's Gate, Kensington, coming forward some three years ago to munificently help and endow the Society with the whole estate, and to supply us with the means of extending the buildings, wrote his wishes as follows:--

"I specially desire that, as far as possible consistent with doing full justice to the babies admitted, the hospital will continue to be so directed and managed that any mother in ordinary circumstances visiting it may feel that almost everything done in the institution could be effectively carried out by herself in her own home after receiving the necessary instruction. As conducing to this end, it is hoped that strict economy and simplicity in regard to buildings, furnishings, appliances, clothing, &c., will be maintained as heretofore, and that the treatment will continue to be conducted, as far as possible, on broad, simple, practical, scientific lines, easily comprehensible by the ordinary mother.

I have no copy of the annual statistics at hand, but I think I am safe in saying that the average mortality has been under 10 per cent. of the admissions. The infants who have died have generally

been moribund when sent in, and have succumbed within the first day or two, or at longest within the first week.

The admissions have embraced all classes, from the children of doctors and professional nurses to motherless foundlings, but we do not take in defectives or babies suffering from specially dangerous infective diseases, such as tuberculosis or syphilis.

The treatment is very simple and mainly hygienic. So far as pure air is concerned the conditions, summer and winter, are almost those of an open air phthisis sanatorium. To prevent chilling, great attention is given to systematic bed-making, on lines equivalent to providing sleeping bags, this being also beneficial to the babies in that they can be kept warm and comfortable, with much lighter and less hampering bed-clothes than would otherwise be needed.

Feeding is conducted on so-called "percentage" lines, all milk modifications being prepared simply but accurately by the nurses and baby "nurse girls" undergoing training in the institution, who are further required to attain proficiency and facility in percentage calculations, and to master the meaning, bearing, and practical every-day use of food values and caloric estimates.

Regarding the utility of the routine practice of making caloric estimates in infant feeding, I am of course aware that there is some difference of opinion in the medical profession, but our experience leaves no doubt whatever in my own mind, or in that of my colleagues, as to the cardinal importance of taking into account not only the percentage composition, but also the fuel value (in other words, the importance of the habit of thinking and working in percentages and calories), not only as a check on mistakes, but also as a preventive of mere slipshod guessing when determining and grading ahead the progressive food allowance for any baby. Thus, knowing the average

caloric need for weight and age of the normal healthy infant, and knowing (as we have found to be the case) that the average thin, ill-nourished, ailing baby of our institution fails to gain regularly and satisfactorily in weight until he is taking from 30 to 40 per cent. in excess of this, we can convey to our nurses without difficulty what we want them to do. Take the case of such a baby, aged 2 months, who has weighed $7\frac{1}{2}$ lb. at birth, and who weighs when brought in, say 8 lb. The average need of a small but healthy, well-nourished baby at 2 months, weighing 8 lb., would, of course, be about $8 \times 50 = 400$ calories, or, roughly speaking, the equivalent of a pint of human milk, or standard humanized milk. Without entering into any calculation himself, the doctor might say to the nurse: "Start the baby with one part of humanized milk to two parts of $2\frac{1}{2}$ per cent. sugar of milk solution (or two parts of water, or of 5 per cent. white of egg water, or of barley water, or what not). At first let the daily caloric allowance be less than a half of the baby's theoretical requirement, and if all goes well work up gradually to the full caloric allowance, in a week or ten days, by using a smaller and smaller proportion of the diluent. Having arrived at full strength, try to cautiously advance the caloric to one and a third of the theoretical during the following week or ten days." Complex as this may seem, the average professional nurse, duly trained, can work the whole thing out in ten minutes on simple lines which we have devised—thus proving herself, as Florence Nightingale so aptly said the properly trained and educated nurse should be, *a help and not a hindrance to the doctors*. Indeed, in New Zealand, while the position we took up in this connection was questioned at first by many of the doctors, I am glad to say that now they come forward to tell us what admirable work the Plunket nurses are doing, how they can rely on them, the saving of

infant life, and the advancement of health they are effecting among all classes, and—most convincing of all—how they have come to depend on the nurses for keeping even their private cases on the right track between their own visits.

I submit that caloric estimation is the only safe, simple and effective way of keeping ourselves and the nurses from making grave mistakes from time to time. In the absence of any readily workable check it is amazing to see what erroneous and divergent tables for infant feeding have been published, edition after edition, and year after year, in some of the leading medical and nursing text-books of the world, and copied from book to book. It is still more amazing to check some of the prescriptions for the artificial feeding of babies met with in practice. Our experience in this matter is in entire accord with that of Professor O'Meara, of Cornell University; reckoning of caloric is, as Dr. O'Meara says, the one available means of saving ourselves from making "ridiculous deviations" from proper standards. Clear-headedness and facility in such fundamental matters are just as necessary for nurses, who have to carry out the preparation and grading of baby foods in practice, and who are daily helping and advising mothers in their own homes, as it is for ourselves. Babies rarely need drugs, but they do need proper quantitative and qualitative food adjustments, and a serious error in such adjustments may not merely be as bad as an overdose of poison, but may actually involve poisoning of the baby's system, not merely unsatisfactory growth.

Routine weighing and charting is done at the hospital twice a week; and case taking, including percentage composition and caloric value of food consumed, is carried out on simple scientific lines by the nurses. The precise amount of food taken daily by each baby is ascertained by providing a "residue bottle" for each cradle, and deducting what it contains

at the end of the day from the specified allowance. I need not say that records made on these lines are very illuminating and have a high practical scientific value.

In the case of ailing nurslings the babies are regularly weighed before and after each suckling, to ascertain precisely what supplementary amount to give. Patent foods are not used. Medicine is rarely found to be necessary. Washing out of stomach and bowels, irrigation, massage for constipation, &c., are systematically taught and used as needed.

Babies who enter the institution using dummies or habituated to night feeding, or feeding more often than every three hours, are quickly broken of these habits.

THE PLUNKET NURSES.

Certificated hospital nurses who have undergone training in the institution, followed by an outside course among the community, are eligible for examination at the end of from three to six months, with a view to appointment as "Plunket Nurses," the name given to our nurses owing to the devoted part played by Lady Plunket and our late Governor, Lord Plunket, who did everything in their power while in New Zealand to encourage, support and build up the Society. Indeed, the original branches in the North Island were formed and organized by Lady Plunket herself, and her untiring enthusiasm and personal, practical teaching were great factors in the success of the Society's health mission throughout the Dominion.

In the part of their course outside the institution the nurses are taught how to help mothers of all classes tactfully in their own homes. They learn to apprehend rapidly the best place for the baby's bed; the best method of ventilating any room with the means at hand; where to keep, and the best way to safeguard, milk in each of the homes; and the numberless simple practical points in household arrangement and management which, added together,

make all the difference to the baby, the difference between health and debility or actual sickness.













REDUCTION OF DEATH-RATE.

Although the infantile death-rate in New Zealand was originally one of the most favourable in the world, and we were told only a few years ago that it could not be appreciably lowered, the results have proved otherwise. To quote from this year's report of the Dunedin Branch of the Society:—

“The Society for the Health of Women and Children was founded just five years ago. Taking the seven years from 1900 to 1907, the average death-rate among children under one year in Dunedin and suburbs was 8 per cent. For the last five years the average has been $6\frac{1}{2}$ per cent.; for the last three years 6 per cent.; for the last two years 5 per cent.; and for the last year 4 per cent. If the infantile death-rate for the whole Dominion were similarly reduced from 8 per cent. to 4 per cent., it would mean a saving of nearly 900 lives every year. But that is not all. One must remember that a reduction in the infantile death-rate involves a reduction in the death-rate among older children also; indeed, looking ahead, it means a lower death-rate throughout the whole community.

“But the Society is less concerned in reducing the death-rate than in improving the health of the people. As a Health Society we are more interested in firmly establishing the all-round fitness of the 24,000 or 25,000 annual new arrivals who will live, than we are in reducing the potential deaths from 2,000 to 1,000. However, the problems are intimately related, since the simple hygienic measures which tend to prevent death in babyhood are also the measures which lay the foundations of strong healthy minds in sound enduring bodies for those who survive to be our future men and women.”

TABLE SHOWING HOW MANY CHILDREN DIE THE FIRST YEAR OF LIFE
FOR EVERY HUNDRED BORN.

	28 %	ST. PETERSBURG and MOSCOW (1910)
	17 %	VIENNA (1910)
	15½ %	BERLIN (1910)
	14 %	GLASGOW (1910)
	12 %	PARIS (1910)
	10⅓ %	LONDON (1910)
	8⅓ %	STOCKHOLM and CHRISTIANIA (1910)
	8 %	DUNEDIN = Average Infantile Mortality for 7 years (1900-07)
	6½ %	" = Average Infantile Mortality for last 5 years (1907-12)
	6 %	" = Average Infantile Mortality for last 3 years (1909-12)
	5 %	" = Average Infantile Mortality for last 2 years (1910-12)
	4 %	" = Average Infantile Mortality for last year (1911-12)

These figures and periods are reckoned to the end of April (the original close of the Dunedin Society's year), not to the end of the Official Year.

N.B.—The reason for contrasting groups of years, instead of giving merely individual years for Dunedin, is to show the stable and sustained decline in the Infantile Death Rate from 1907 onward. The fall would have appeared more striking had the four later periods been compared, not with the average of the preceding seven years, but only with the year 1907, when the death rate was 9½ per cent., but this contrast would have been misleading.

Note the extreme range of infantile mortality from the death within a year of more than a quarter of the children born in St. Petersburg and Moscow to the death of only one in twenty-five for Dunedin.

The figures are almost as striking if taken for countries instead of cities. Thus, the latest annual statistics available show that out of 1,000 children born there died in the first year of life:—

In Russia, about	250
Germany and Austria, about	175
" England and Wales (for 1910)	117
" Norway (1908)	76
" New Zealand (1911)	56

Next to New Zealand, the Norwegian infantile death rate is the lowest in the world. This is attributed to the fact that in Norway nearly all babies are suckled.

The Registrar-General for the Dominion, referring to a comprehensive world-wide statistical table given in the latest Official Year Book for New Zealand, says, "This table, giving the rates of Infantile Mortality in various countries and cities, shows that as regards the Preservation of Infant Life far better conditions obtain in New Zealand than elsewhere."

In dealing with our infantile statistics I have not entered into the part played by factors other than the Society's work, because that would be beyond the scope of my paper, but in an exhaustive consideration of the subject one would have to take into account other aspects of the work of the Public Health Department, including the establishment of maternity hospitals, &c.

DISCUSSION.

The AUTHOR explained a number of diagrams on which curves were plotted showing the result of observation on the feeding of children and animals.

Dr. R. DONALD said he did not intend to discuss the paper as it spoke for itself. The one thousand-acre farm which the author had referred to was not a baby farm, but a lunatic asylum. He (the speaker) for over six years was an assistant in a neighbouring medical hospital, and had the privilege of seeing the enthusiasm which Dr. King put into his work. The views put forward by the author were the result of the hard work of years. There were some who thought indeed that Dr. King neglected his other work in his enthusiasm for the subject he had dealt with that day, but as a matter of fact he put as much enthusiasm into his other work as he did into the subject now before them.

Dr. DUNDAS (Ramsgate) said he was particularly struck with the paragraph in the paper in which the author stated that the newspaper Press of New Zealand had played a leading rôle in the movement. It appeared to him that this was a very good idea, and one which, so far as he was aware, was not made use of in this country. He thought that if it could be used here it would be a great success. They all knew that many newspapers contained columns devoted to health and other matters, which must be popular or they would not be printed, and he was certain that if advice could be given as to the rearing of babies generally in the general Press it would attract attention. He was going to suggest, therefore, that before the Conference parted they should not lose sight of the idea. It seemed to him there were three possible ways whereby advantage might be taken of the suggestion. For instance, some of the voluntary associations which formed part of the Conference might make themselves responsible for preparing

columns of matter for issue to the weekly or daily Press throughout the country, or it might be done by a Government Department, or even by the Chairman himself. The Board of Agriculture issued pamphlets dealing with vegetable parasites, but the ailments of babies were of considerably more importance than the illnesses of cabbages. Whether the Board of Education or the Local Government Board would be the proper Department to deal with such a matter he did not know. After Dr. King's statement about the differences of opinion amongst the experts, he was almost inclined to think that the best plan would be to get a few of these gentlemen together and let them decide on what they thought was the proper food for infants. Let them agree on standards, and let them perhaps undertake the business of preparing articles for the Press. If he was in order he would like to move that the matter be referred to the Executive to consider whether something could not be done in this country to utilize the Press as a source of educating the general-public in the care of babies.

Dr. A. E. NAISH (Sheffield) expressed the pleasure it had given him to hear Dr. King, as he had for some time taken an interest in reading of his work. His real object in rising, however, was to ask how Dr. King got the average line he showed in his chart, and how large were the variations above and below the line in individual cases. He also would like to know if Dr. King had come across many cases where the children had been taking amounts considerably above the line, but, notwithstanding, had been doing perfectly well. The experience he had had was that variations above the line were no detriment to the infant.

Dr. ERIC PRITCHARD (London) said that with regard to the feeding experiments which Dr. Truby King had referred to, and especially with regard to the proposition he made (and which had been made by other speakers) that there should be some definite standard drawn up as to what constituted the normal diet of an infant he would like to say a few words. He did not know how Dr. King had arrived at his own standard, but his own view was that there was no such thing as a real standard. Each child had a standard, and was a law unto itself, and the amount of food which each particular child required depended more on external temperature than anything else. Inasmuch as eight-tenths of the whole food was required for the purpose of keeping a child warm, it seemed illogical that a child exposed to a high temperature should have the same kind of food as a child exposed to a cold environment.

Therefore it seemed to him almost impossible that anyone in New Zealand could draw up a standard which would be a standard they would require in England. Beyond that there were many other conditions which seemed to him also to make alterations necessary in a standard. For instance, there was the amount of sunlight. Sunlight was one of the most important stimulants, and if the metabolism of the infant was low it could not make use of the same amount of food as a child which had a stimulant which promoted its metabolism. Therefore he was opposed to drawing up a standard. It was the drawing up of standards as to which no two authorities could agree that led so many people into error. They seemed to think that a child was a machine and could follow any law laid down for it, but he thought it would be a great mistake for their Society to attempt to draw up such standards. He thought they should rather encourage those who had the control of depôts, or consultations, or schools for mothers to exercise their own individual judgment for each individual case.

Dr. TRUBY KING, in reply, said that when Dr. Donald mentioned that it had been suggested that he might neglect his work in the mental hospital they would understand that he was working nearly the whole of the twenty-four hours of the day, and the assumption was that a man could not carry out all the duties, but as there were several assistants and able colleagues there was no neglect of the asylum work. He understood perfectly that Dr. Donald did not make the allusion in any invidious sense. As to Dr. Dundas's remarks about a weekly column for the Press he thought that must commend itself to everybody. The suggestion was full of common sense, and he could only say that the benefit which had accrued from the consistent editing of the column which went to all the Press in New Zealand had been perfectly obvious. Any of them would be satisfied if they saw the thousands of grateful letters received from parents, not only in New Zealand, but from other places where they had read what had been printed. As to the question of arriving at standard dietaries, and as to what were the standard requirements of infants, he thought a great deal could be done. He did not entirely agree with the remarks made by Dr. Pritchard, although in most things they were in accord. He was asked how it was that one arrived at the standard, and in reply he could say it was easily arrived at. He took the leading observations which had been made, and there were a number which had been made in Germany for instance, with regard to weighing, before and after. They weighed a certain

number of cases themselves, and they took the average of all these. The way they arrived at the particular curve which Dr. Naish referred to was by adopting the method of an engineer in dealing with the speed of a steamer. As to what had been said on the variations of different climates the standards arrived at in Germany were absolutely applicable in New Zealand. He was prepared to submit their case books. He had their records showing that children did require these things. At the time he left New Zealand there were twenty-three babies in hospital, and he was prepared to show that each case came up to a definite standard. He would not suggest for a moment that anything arbitrary should be laid down, but at any rate the result of telling a woman that at 5 months of age the child weighed so much, and in giving her the definite requirements of the child, had been such as he had shown them. They had found from the hospital records that there was just as much law regarding the feeding of children as there was with regard to the feeding of the lower animals. It was, of course, a matter which one could not further explain there, but he was prepared to submit the books and records in support of what he had said. He certainly had hoped that it might be possible in connection with a Conference of that kind to lay down what would be the average requirements of children under the conditions of temperate countries like New Zealand and England. The idea that there was any wide divergence between England and New Zealand in regard to climate was wrong. They were islands of very similar size, and they found that the laws which obtained in England also obtained in New Zealand, and as he had said, the standard arrived at in Germany and the standards arrived at in America applied. That had been their great guide with regard to the matter.

SECOND SESSION, AUGUST 4.

At the afternoon session Sir GEORGE NEWMAN (Medical Officer of the Board of Education) presided.

CHAIRMAN'S ADDRESS.

Sir GEORGE NEWMAN: Ladies and Gentlemen,—I feel it a great honour to be asked to preside this afternoon. I presume that it is because of my interest in infant mortality in the old days, and because of my interest in children and my responsibilities with regard to them now, that I have been asked to preside. I think the Conference has cause to congratulate itself upon many things. In the first place

it can congratulate itself on the present position of this movement. It seems a very few years ago that the interest in this great problem was *minus* and the interest now certainly is *plus*. There has been an enormous growth in public opinion. There has been an awakening on almost all sides, and, best of all, a practical result in the very remarkable and almost phenomenal reduction in infant mortality. I am one of those who attribute that reduction not wholly but largely, and more largely than anything else, to the advance which has been made upon the main lines of the policy of this Conference. I was reading the other day with much interest the four or five complete tables which we now have presented every year in the Registrar-General's return of the analyses of the deaths of children under 1 year of age. Those are tables which were not formerly produced. I look upon the production of that table year after year as one of the most valuable pieces of scientific evidence with regard to infant mortality which we possess. I was reading from the first table down to the last—from 1907 to 1910—and comparing the causes of death in infants in these four years, and I do not think it is only an episode or only an accident that the decline in the death-rate of infants has been more marked in the conditions which respond to an educated motherhood than in the conditions outside the sphere of education and control. I think that is so. If it be so it is an extraordinary piece of evidence of the predominant value of the influence which has been set going in schools for mothers and otherwise upon the active period of motherhood in this country. For instance, the decline which has taken place in that great group of diseases which we call the diarrhoeal diseases, and in the group of diseases classified as miscellaneous, which include the great group of lung diseases, the reduction of .7 in 1910 has been double or three times the reduction which has taken place in that great root of disease which we think upon as immaturity. I have made the practice myself in thinking of this question of dealing with the diseases of children in three groups. First the great group of conditions which we call immaturity—the group of conditions over which we have no direct control; a group of conditions due almost entirely to the physical condition of the mother. Of course I am generalizing, but it is a group of conditions which on the whole are due to the physical condition of the mother. Then, secondly, there is the group of lung conditions typified by bronchitis and pneumonia which are due mainly to exposure and to the fact that the child has come into a cold world; because, take it as you like, there is an enormous change in

the temperature when the child passes from the mother's body into the world. That alone is one of the great causes of death of infants. Then there is the third group of diseases which we speak of as the diarrhoea group, and which are due to ill-feeding; to all sorts of bad forms of feeding. In 1910, which is the date of the last available figures, 25,900 children died in the immaturity group; 16,000 children died in the pneumonia and bronchitis group; and 11,000 children died in the diarrhoea diseases group. My point is that the decline has been in the groups of conditions which respond most to education. I am thinking of education in its very broadest sense—the education of the people with regard to the importance of the great problem; the education of Parliament and of municipalities, and of the medical profession; the education of the great mass of motherhood of the country through the Press and through the schools for mothers, and through a variety of agencies. There has been an enormous advance in all sorts of information and education with regard to this problem, and that has borne fruit in the remarkable decline which has taken place in these four years, viz., 118 per thousand in 1907; 120 per thousand in 1908; 109 per thousand in 1909; 105 per thousand in 1910; and the extraordinary figure of 95 per thousand in 1912. I doubt if there has ever been a movement which has reaped its harvest with such astonishing rapidity as the movement on behalf of the prevention of infantile mortality. I think it is a matter which should not only encourage this Society to make it feel that it stands on the top of happy hours, but should make us all feel that a systematic attack from a dozen different directions on one enemy is the way to grapple with the great problem of physical conditions in this country. There is no one panacea; there is no one answer. Causes and conditions which occur in the body of the mother arise from an ancestry of previous causes so complex and so remote that it is impossible accurately to analyse them. I believe it is because the attack has been made not only frontally but on the flanks of the problem by a dozen different bodies that we are able to meet together in conference at a time of most extraordinary success. But I think we must warn ourselves that next year or the year after we may not be able to reduce from the 95 per thousand to a lower figure. I am not very hopeful myself in seeing much further reduction. It may happen. Let us hope it will happen in the immediate future, but I think the reduction can hardly go on at the prodigious rate of fall from 145 and 150 in 1904 and 1905 to 95 in 1912.

I want to make one further observation with regard to the papers which are to be read. I believe there is a very intimate connection, and not only intimate, but organic and vital, between education broadly understood and broadly interpreted, and those other methods for the reduction of infantile mortality. Our friends and colleagues in the States and in Canada have interpreted the solution of these problems very much along the lines of associating education in one form or another with the various other means which are used for the reduction of infantile mortality. We have five or six papers to be read by capable workers on the question of milk supply, and I want to say, if I may, without reflecting in any way on other people's views, that I believe in connection with the milk supply in its relation to the prevention of infantile mortality we need to remember that education ought to be the predominant factor. I with others in this room am guilty of having started a milk dépôt in a district for which I was the Medical Officer in 1904, and in which we used both the fresh and pasteurized milk and dried milk, and the distinct feature of that dépôt was that we created something which was so happily afterwards called a school for mothers. That is to say, we would only feed the child of the mother who would attend the babies' clinic, and receive from the medical and nursing staff something in the form of the elements and preliminaries of education, and I am convinced that where a milk dépôt is properly associated with what is now called a school of mothers there you have a splendid result, but where you endeavour to proceed without practical demonstration and feeding there you will find your results will be of unequal value. Sometimes your methods will succeed, and sometimes they will fail. So I would like to combine education with those other methods by which we are stemming the tide of infantile mortality in almost all parts of the British Empire as distinguished from the great Russian Empire, where in Moscow the toll is 333 per thousand, and at St. Petersburg it is very little less—absolutely gigantic mortality. In the British Empire we have been able to get ahead in the last few years, because there has been a sound extension of education, a better milk supply, and progress in other directions. We have to educate the mothers. But we must keep on training the child in the elementary schools so that with the mother at the one end and the child at the other end we shall be able to bring our system of education to bear in such a way as will, I think, yield good practical results. In all this educational work, as we have heard from others to-day, we require—and it is not a luxury but

a necessity—an enormous bulk of voluntary work; first rate, constructive, scientific, voluntary work. I am a very strong believer indeed in the voluntary agency. I have seen the splendid results, and I am a strong believer in the influences which are brought to bear upon the problem by what is called the layman, who is animated by high motives, and who brings to bear his or her influence in this great work. We are extremely anxious that the members of the Conference will not hesitate to discuss the papers, for we want to transact real business.

THE NECESSITY OF IMPROVING THE TRAINING OF MIDWIVES, AND ITS BEARING UPON INFANT LIFE.

By Miss ALICE GREGORY.

Hon. Secretary of the Council for the Higher Training of Midwives.

I DO not suppose that there is any subject on which the public are so profoundly ignorant as the training of midwives, on what is the essential difference between a good training and a bad one, and this is probably the reason why we are content—with regard to at least one half of their work, the care of the infant—that England as a country should remain archaic in its methods and deplorable in its results.

Ask the ordinary nurse, who has just passed the Central Midwives Board examination, as to her training, and her answer will probably be: "We had a first-rate training; I saw [some prodigious number] cases in my three [or four] months, and I had a splendid lot of abnormalities."

If pressed on the subject of her infants, she may add in an offhand manner: "Oh, they did all right; of course some of the bottle-fed ones died, and the prematures—much better they should. Yes, we always gave milk and barley-water—1 in 3—that is the only thing for these hand-fed children." And one

comes away stunned and silenced by the unfathomable depths of her ignorance, walled in and preserved inviolate as it is by the high walls of complete self-satisfaction.

I propose to-day to deal with the subject more technically than is usual in a mixed audience, that I may elucidate the fundamental errors in this view, a very common one, of successful midwifery.

In the first place a midwife succeeds or not in proportion to the difficulties she *prevents*, not those she attends. In a large training school one does of necessity meet with many abnormalities; patients who have declined to follow out their treatment, or to report themselves periodically, as desired; patients who have booked at the last moment, or who have arrived as emergency cases, without booking at all; patients whose symptoms have been so masked that they have escaped the trained observation of the matron or house-surgeon who booked them. There are, I deeply grieve to say, even yet a few training schools where this observation is never exercised, where the patients merely give in their names, addresses, and the number of their family, to some clerk or secretary, but where no details are ascertained as to their health or stature.

In such schools I do not question the pupils *will* see a splendid lot of abnormalities, if it is indeed splendid to see a mother stiff and foaming in an eclamptic fit, or straining in the most hideous torture to expel a large child through a distorted pelvis, and to know that if she lives through it herself the chances are 100 to 1 against the survival of the infant.

It is of all things important that a midwife should learn, both theoretically and practically, how to diagnose the dangers which threaten both mother and child during pregnancy. She must be taught during her training, if she is to carry it out in her own practice, to test for albumen in the case of every

primipara, both at the time of booking and also shortly before full term. If her test gives an affirmative answer, she must continue to test weekly, and meantime the patient must have most careful instructions as to diet and way of life generally. Pronounced cases should also see a doctor, and I think it is the vague feeling that a doctor is always hovering mysteriously in the background, midwives being only qualified to attend cases of normal labour, which causes the public to view with equanimity the ignorance too frequently shown by the inferior order of practitioner. They forget that in the first place a midwife must detect and diagnose danger before a doctor is called in at all; if she is too profuse in her recommendations of medical aid she will infallibly lose her practice. Moreover, the doctor is probably extremely busy with his own patients, and not acutely interested in hers. He will, therefore, possibly just look in in answer to the summons, and speed on his way with a hasty "All right, nurse, you know how to treat her. Send for me if she has a fit."

Then, with regard to contracted pelves, it is a great disgrace to a midwife if she is constantly finding when her patient is in labour that the child and the pelvis are an obvious misfit. If she has taken full particulars at the time of booking of the patient's history, whether breast-fed, late in walking and teething, and also, if any had occurred, of her previous labours; if she carefully measured externally with a pelvimeter every primipara, and every mother who has already had instrumental or complicated labours, it will have been quite simple, in many cases where the contraction is only slight, to recommend such a form of diet as will keep the child of a reasonable size. In cases of greater deformity, she would take the patient herself to some real obstetric authority, such as the surgeons of a good maternity hospital,

who will be in a position to judge whether the patient can be delivered naturally or with the aid of instruments, whether the labour should be induced at the seventh or eighth month, with the natural sequence of a delicate child, or whether Cæsarean section should be resorted to at full term, an operation giving a better prognosis for the infant but slightly increasing the risk to the mother.

All these knotty problems lie outside the midwife's scope, but it will entirely depend on her wisdom and foresight whether they are referred at the right moment to a tribunal really capable of deciding them, or whether the pregnancy is allowed to proceed to full term, the patient eating and drinking heartily meantime until the moment arrives when both nature and science fail to produce a 9 lb. baby, with a head 13 in. in circumference, through a 3 in. conjugate, and the destruction of the child is the only resource available if the terrible alternative of a ruptured uterus is to be avoided.

Our complacent young graduate, you will remember, made no mention of all this office work, the essential foundation of all true midwifery. She rejoiced to find a child lying across the pelvis—a transverse presentation as it is called—because it added another to her list of abnormalities, sublimely unconscious of the fact that the number of such presentations which she had known discovered and corrected before labour began would really have been the thing to boast of. It is a comparatively easy process then by external manipulation only; she could easily do it herself in her own practice, without transgressing any of the Central Midwives Board rules, but one cannot learn everything in three months or even six, and these little facts, on which incidentally the lives of both mother and infant, but especially the infant, may come to hang, have either not been taught her or else have failed to secure her attention.

I need not dwell upon the labours themselves, since on them, and on them alone, the attention of the public and the midwife—too often of the training school also—is apt to be focussed. Our teaching in this respect is probably not materially behind that of other countries, although I imagine that in those where the problem of the decreasing birth-rate has long made itself felt the condition of the child would be ascertained more frequently than with us, and that symptoms of distress in the fœtal heart sounds would be regarded as a more determining factor in the line of treatment. Look through the notes of almost any midwife on a long case which she has conducted herself from start to finish. The number of internal examinations, each one a danger to the patient, may be large, or it may be small, according to the views of the training school plus the timidity of the nurse, but if you find in the notes a really full and accurate description of even one abdominal examination, I shall be surprised, still less a faithful following from hour to hour of the child's condition as revealed by its heart sounds.

It is also not necessary to do more than glance at the subject of infantile ophthalmia. It is generally recognized now that our blind asylums have been filled year after year by people who would never have been there at all if their eyes had been scientifically treated at the moment of birth. The most optimistic statistics give one quarter of the cases of blindness to this cause; others speak of one-third, and others again of one-half. Again and again the subject is brought forward, spoken about, written about, discussed *ad nauseam*, but in spite of all, that precious asset, the eyesight of the nation, is left in the hands of midwives, some of whom have had a three or four months' course of training and some have not, but in any case the majority of them are still, in 1913, rough, unskilful women, with practically no knowledge of either the advantages or the dangers of antiseptics, so that it is

almost as perilous for them to use them as to leave them alone.

But it is not only during pregnancy and labour that the skill and wisdom of our midwives have been proved so criminally defective. Their lack of knowledge how to regulate the affairs of both their patients, large and small, during the puerperium, has probably given rise to more illness and discomfort in the mothers, and more loss of life in the infants, than even in the earlier stages.

Infant-feeding is a very large chapter in itself, and cannot be satisfactorily disposed of by the old axiom: the breast, full or empty, and as the only alternative, milk and barley-water. How to recognize an empty breast (the opinion of the mother herself is a very poor guide). How to encourage milk production. How to recognize if the infant is thriving; if the reverse, what is the cause of the failure. These are all points on which careful teaching is needed. The midwife is of necessity the person who will first regulate the conditions of each little new life among our working folk. If she has made a real study, both of infant-feeding and also the idiosyncrasies of infant digestion, she will be in a position to judge whether the mother can nurse entirely, partially, or not at all. If the latter, whether each individual child under her care shall be fed with whey, whey and cream, peptogenic milk, pasteurized milk, Cautley's top-milk, Tru-milk; in what quantity and for how long. She will realize that she may have to reverse her treatment at a moment's notice if unfavourable symptoms should arise; that constipation and diarrhœa alike denote errors in feeding, and that for the former, at any rate, an altered dietary is the remedy, and not the barbaric old custom of deranging an infant's digestive apparatus with strong aperients; that if the diarrhœa persists a doctor must immediately be sent for. All these matters are not learnt in a day, and our Continental neighbours—France, Holland, Belgium, Italy

—know what they are about when, in the interests of the future generation, they demand that their midwives shall have had a two years' training, to be spent not only in the lecture and labour rooms, but largely *in the lying-in wards and nurseries attached*. But, even if we ever do obtain a suitable training for this very important profession, we have not yet reached our goal. We have still to provide a living wage instead of a starvation pittance, and also to take means to effect a friendly relationship between the midwife and her successor, the health visitor. In the country the latter practically does not exist, and the midwife remains *the* supreme authority on the bringing up of children, but in towns the friction between the two is sometimes a very serious matter. As we have already said, the midwife needs to make a careful study of each little digestive apparatus committed to her care, but it is hard on the child that the result of her observations should be regarded as not worthy of consideration by the health visitor, and that the latter should start *de novo* to experiment on its unfortunate little stomach. If we could only promote co-operation it would be a tremendous incentive to the midwife to study, that she was expected to hand over her charge, not only in good condition but with its scheme of nutrition built on a scientific basis, and justified by its increase of weight since birth. And the same would apply to the health visitor, who would be liable henceforward to friendly criticism of a more discerning nature than that of the parents on the advice given to her charges.

DISCUSSION.

Miss ASHTON (Manchester) said the whole trend of Miss Gregory's paper was towards State payment, and many of those who were working on midwives' supervising committees were of opinion that they would never be able to improve the training and standard of midwives unless they were paid like Medical Officers of Health. They were as

necessary to the health of the community as were the Medical Officers of Health, but at present the pay which midwives received was such that it offered no inducement for women of education to go in for the profession. It was a most honourable profession; but was most badly paid. She hoped that there would be a resolution moved from the Conference that there should be some State aid for the training and the payment of midwives throughout the length and breadth of the country.

Dr. ROBERTSON (Birmingham) thought that if the Conference did nothing else it would have achieved a really good work if it could impress the country with the necessity for the better training of midwives. He felt that at the present time the training in most of their institutions was even more dangerous than the practice of the old untrained midwives, because many of them after six weeks' training were turned out to cases in the district with a diploma which he knew was not a certificate, but which was meant to show that they were fully competent to undertake all sorts of duties. He felt very strongly that the Government ought to insist upon no one being allowed to go out as a trained midwife until she had had at least two years or perhaps three years of training. He believed that nothing short of hospital training would make a really efficient midwife, because such training taught a woman—he was going to say to be obedient, but perhaps he had better say it taught her to know what she ought to do and what she ought not to do. He was quite certain that to allow them to go out after six weeks' or two months' training was a mistake, and he hoped some representations would be made on this point. He knew the question bristled with difficulties, because the supply of midwives was not great at the present time, but under the Insurance Act they were going to hand over a very much larger number of cases than they ever had done before to midwives, and every indication, he was glad to say, pointed to them being more adequately paid. He recognized that in the past the payment which midwives had received was such as to discourage the more competent women from entering that profession.

Miss LUCY HALL (Midwives' Institute), as a trainer of midwives, agreed that the training midwives received was inadequate for the great responsibility which was placed upon them, but she did not think the State training of midwives would get over the difficulty. Midwives ought to be paid adequately; in the past they had been paid abominably; and how could they expect an educated woman to pay for an expensive training and live on next to nothing? She

thought the English-speaking race in the Colonies must be ashamed at the way they were content here to turn out women with three months' training. The trainers were asked to do almost the impossible. They were asked to give women the knowledge they ought to have for the care of the women and babies of England, and they longed to do more, and give them more knowledge, but how could they? If the country would legislate on the lines that the midwife should have a longer training and should be paid better, she believed there would be a better standard of midwifery in England. Midwifery was a most important matter, and she sincerely hoped the Conference would bring forward something which would help them in England at the present time. That day they had listened to a great deal about artificial feeding of the child, but she had not heard a word said about how to teach the mother to bring up the baby.

Dr. MARY SCHARLIEB (London) remarked that she worked for a long time in Madras, where, owing to the prejudice of the native women, most of the midwifery was in the hands of women, and it was quite right that it should be so there. The women who trained in the Government lying-in hospitals had nine months' exceedingly good training, and even at the end of the nine months they did not know too much. Therefore to say that a woman would be fit in three months was not reasonable. How things were to be altered was a matter for the public and perhaps the Legislature. The Legislature could not legislate in advance of public opinion, and they must therefore try and make public opinion strong enough to force them. The doctors ought to say what ought to be, and to demand that it should be.

Dr. DAVIS (Woolwich) said he would like to ask Miss Gregory one question as to midwives recommending the mother to put the baby to artificial feeding. It was an exceedingly important point which was continually coming forward. Miss Gregory seemed to suggest that the midwife should take the responsibility of telling the mother when the time had come to give artificial feeding, but he asked if the author really thought it quite wise for a midwife trained for two years to give such advice, or whether she did not think it a question which should be referred to a medical man. He was bound to confess that there were many medical men not so competent to advise on that point as the midwife who had been trained for two years, but still he thought they ought to impress the idea of the necessity of getting a good opinion on such a point, and unless they

did this they would not get it. Personally he disagreed with Miss Gregory on that point.

Colonel GREEN (Indian Medical Service) said he would like to support what Dr. Scharlieb had said. In Calcutta they gave the midwives a year's training, and he did not think that was too long. They had midwives who were out from England, and he must say that irrespective of the point that the midwives they trained in Calcutta were their own pupils, and also that they had knowledge of the country; putting all that aside he preferred the women trained in the country, on account of the great practical experience they had, although they might not be so well educated and although they might not be pure European. He thought that what had been suggested was practically making a new class of practitioners, and they had great experience of that in India. They had so-called hospital assistants who were not qualified, midwives, assistant surgeons, and graduates. Their experience of these lower grade practitioners was that, although they were essential on account of the fact that they must be cheap, yet they were nasty. What they wanted was to have the best training possible, and he thought it would be better to keep to the old style of nurse to which Dr. Robertson referred, who, at any rate, had a large practical experience, than to have a sort of specialist in one subject only; or in other words, a new class of practitioner.

Miss GREGORY, in reply, said that in regard to Miss Ashton and her remarks on State payment she sometimes thought that people did not recognize what a revolution had taken place owing to the Insurance Act and the maternity benefit. The lamentable thing was that they did not seem to know how to deal with it. The mother had now 30s. to pay for her necessities, and she held that the first of the necessities was the receiving of skilled attendance. Midwives ought to take 15s. or £1 1s. of that, although if the doctor came in she had to take less. In the old days the mother had to pay the midwife out of her own pocket, and now that the State paid 30s. why should they not take advantage of it to raise the midwives' fee, or otherwise they would continue on the old road where they were before, and the money for the maternity benefit would go in buying the children boots or paying for the husband's drink? Dr. Robertson said he would like all midwives to be trained nurses of two or three years' standing. Quite obviously all of them who went about saw the enormous advantages of that course, but she would like to ask the speaker if he had ever considered how many trained nurses there were in hospitals

who took up midwifery, and who afterwards went in for it as a vocation. They learned midwifery, but they did not go to the relief of working mothers, and the problem was how to get these mothers cleanly and decently attended to afterwards. It was not a question of how many people they got through examinations. They wanted those who would look after the working mothers, and she would like them to have one year's training, and, better still, two years'. She believed she represented the only hospital in England that so far had gone in for a really prolonged training—that was the Home for Mothers and Babies at Woolwich. They would not receive anybody for less than a year unless they had had some general training beforehand. They tried to make it two years, and that would be better, but they were met with the practical difficulty that so long as the Central Midwives Board demanded only a three months' theoretical course, and demanded of pupils twenty cases in six weeks, if they could get them in, it was practically impossible to get young women to take so long a training. They were out of pocket all that time, and could not afford to do it. Being profoundly ignorant they asked why they should go in for two years' training at their Home when they could get the training elsewhere in three months. Therefore it was one of the most uphill struggles which could be imagined to try and prolong the period of the training of midwives, and although the hospital was started with that object yet until the Central Midwives Board altered its regulations it would remain an uphill work. Dr. Davis spoke about midwives advising mothers with regard to artificial feeding. If all midwives had the supreme advantage of working under the medical men who were present, and who would give them a definite answer, she would most warmly and entirely agree with what was said, but having worked as a district midwife in Somerset for eight years and in other parts of England she was afraid she must say she found the ordinary medical practitioner was not of great use in regard to this. If he was asked for an answer he probably would not give it, whilst if he did give an answer it was generally to tell them to give Swiss milk. She said with all deference, for she was not a doctor but only a midwife, that until they had advanced the education of the medical practitioner she would decline to put the future of all the very poor babies into his hands. If the babies were the doctor's own patients well and good, but if the midwife were always to ask the doctor it meant that the mothers would not employ the midwife very much. She maintained that the doctor with all his other patients, and with all his

expensive scientific training, was not the person to sit for nine or twelve hours in the patient's house, looking after all her immediate wants during labour. As a matter of fact they did not do it, but they went away and left it to the women, who did three-quarters of the work. But the skilled midwife would do that herself. Therefore let them train midwives not to be an inferior order but a lower order of specialist. She quite admitted that the supreme authority in the country was the chemist. (Laughter.) Because they had no qualifications they gave advice and did not charge anything. But after the chemist came the midwife, and a long way after came the doctor—(laughter)—and if the midwife always sent the patient away and would not give any advice—immediate daily advice—as to what should be done, the mother would get the advice from others. If she called the doctor in he would probably not give any advice at all, for he would not be interested, and would very likely be very much annoyed at being brought out of his way for what he would think was a very trifling affair. She did not think that was fair to the working people or to the midwife.

The CHAIRMAN announced that Dr. Addison was unable to be present.

Mrs. KITSON CLARK (Leeds Babies' Welcome) said she had hoped the paper of Dr. Addison would have been read so that the opportunity might have been given of asking what all those interested in schools for mothers would like to know. The question was whether there was any chance of such schools receiving grants from the Board of Education. They felt that they were doing a very valuable work for the State. At Leeds they spent about £800 a year and had about 1,500 mothers on their books, and they did not get a halfpenny from any public source whatever; they had to beg for every penny. They had asked several times for a grant from the authorities, but the first condition was that there must be ten lessons in their course and that every lesson must be not less than forty minutes long. Anyone who had had experience of a babies' welcome would know that such a lesson would be absolutely valueless to mothers. In the first place they could not keep the infants quiet, whilst if they put them into a separate room they would yell. (Laughter.) But beyond that they had to consider that they were dealing with women who had left school at 13 and had not received any teaching since; and in such cases they could only put one small fact into their minds at a time. With these facts before them and their lack of money they thought it only waste of time to give lectures to mothers of more than twenty minutes' duration. She

wondered whether the Chairman could suggest any method by which they could get a reasonable grant, and considering the work they had done she thought they really deserved one.

The CHAIRMAN said he was afraid he would only get himself into trouble if he spoke. (Laughter.) He could only say that the admirable speech of Mrs. Kitson Clark ought to have been made at the morning session, when the President of the Board of Education was present, and they could make him feel as uncomfortable as they liked. (Laughter.) He was only a servant and could not announce the policy of the Board of Education, but he thought he would be quite in order in repeating the remark that Mr. Pease himself made, which was that it was his intention in the new Bill he had under consideration, and which was to be placed before Parliament at an early date, to deal with nursery schools and schools for mothers. He thought also he would not be divulging any confidence if he said that he knew Mr. Pease had had under consideration in the last few months, with great detail, this very question which Mrs. Kitson Clark had so ably and vigorously presented. They quite recognized that what were called the technical regulations, under which grants were now paid to these schools for mothers—and there were about a dozen schools receiving a Government grant in that way—were entirely unsuitable and inadequate for the purpose. They were not instituted for the education of mothers, but for the feeding of children, and it was recognized by the Board of Education that there must be a substantial modification of these regulations in order to bring these schools for mothers into the educational system of the country. He knew that it was the fixed intention of the President of the Board of Education to consider in his forthcoming measure the very problem which Mrs. Kitson Clark had delineated. He was not at all sure if it would not be a good thing for any lady or gentleman present that afternoon who was qualified to speak, and who had the experience which Mrs. Kitson Clark had, to state to the Conference the basis on which they thought such Government grant should be put. If they did so they might rest assured that their request would receive careful attention. He did not know that he could say anything further, and, perhaps, what he had said would be looked on by some as possessing the merit of successful ambiguity. (Laughter.)

THE RELATION OF THE EDUCATION OF THE GIRL TO INFANT MORTALITY.

By CAROLINE HEDGER, M.D., CHICAGO, ILLINOIS.

WE hear of decreasing birth-rates and widespread inability to nurse, and on the mother's ability to nurse her child depends in large measure its chance of life. Spencer fifty years ago flatly stated that the high-pressure education in vogue in Great Britain produced flat-chested women who could not nurse their children. If this is true, education has a fatally close relationship to infant mortality.

The destruction of the unborn goes constantly forward. Why? Because the girl is either not prepared for her reproductive life by her mother or the school, or is prepared in terms of pathology or fear. Why should she, when under economic pressure, preserve the product of conception if it is only a part of something so unspeakable that she cannot be taught the most rudimentary physiologic facts or hygiene that she should know?

We hear of the ignorance of mothers who feed and care for their babies so badly that they die. Why? Because the education to which we subject the girl has up to this time nothing, and now has very little, in it that will help in the tremendous responsibility that falls upon her in carrying forward the race.

On this point there are encouraging signs in the formation of little mothers' leagues and little mothers' schools, but these are as yet wholly inadequate in number and in methods. The development along the line of domestic science ensures for the older children a better home, but little has been taught in such schools about infant conservation, one shining exception being the Washington Irving High School in

New York. To save the baby's life there must be, first, an attitude toward life that makes the woman willing to reproduce; second, normal development of the reproductive system, including the breasts; third, positive knowledge that will help her to preserve the child's life after it is born.

To get at the relationship of the education of girls to infant survival we must know in a large number of cases—a concerted study, if you will—the effect of various kinds of schools on the developing reproductive system.

I wish to call attention to the widespread and absolute indifference as to the effect of education on the reproductive life of the girl, even in relation to the establishment of a reasonably normal menstruation. A personal experience of one and a half years as physician in a mail-order house employing 4,000 girls, all common school graduates, led me to suspect that the girl as she comes from the school presents a vast amount of inefficiency due to menstrual disturbance. Whether this was due to school conditions, or to her life in the home, I could not at that time determine. I have since ascertained that we have no data on which we can eliminate the evil effect of the school, but we can all cite individual instances of criminal indifference.

It became necessary, in a small town, to investigate a high school in which a serious moral condition existed. The principal, an intellectual woman, felt helpless to cope with the situation. In trying to get at the difficulty I questioned her as to the effect of the education she was dealing out, not only on the reproductive life but on the general health of the girls. About these points she knew absolutely nothing; she said, "Some of them were pretty pale their last year." Nor is this woman an exception; physical educators, even, are mostly asleep. They think if they excuse the girl from the gymnasium floor during the actual

days of menstruation, their whole duty is done. Unless they consider the girl as a whole, a possible factor in evolution as well as an effective unit, their work has only an environmental or economic value. They do not conserve the life of the future child unless they promote the development of the reproductive system as well as that of the nervous and muscular systems.

In a study last year of 314 girls in the University of Chicago, the following tables, taken from the records of the Department of Physical Education, show that 32 per cent. changed their type of menstruation during the year under the stress of university life. Miss Dudley, the Physical Director, who is thoroughly awake on these problems, was able to improve the type of only fourteen of these girls. One of the interesting tables shows the relation of menstruation to constipation, and the possibility of the control of constipation by physical education. The women were, as you will see, largely from 17 to 21 years of age, an age at which we could expect some stability of the menstrual function; and yet over one-fourth of them altered their type of menstruation in that one year, and very few improved.

The period of reproductive development of the girl coincides with school life, and if we force her into school, we must undertake, as Margaret McMillan so well points out, not to injure the material.

From the point of view of possible motherhood there seem to me to be three classes of girls in schools. First, a small number of girls that are so fine physically that no strain will hurt them. At the other end of the scale occurs a group unfortunately larger than that I have been describing, that by inheritance, lack of nervous balance and acquired infections should never reproduce. The aim of education in this group should be economic efficiency.

CHANGE OF TYPE OF MENSTRUATION.

Age	Number	Irregular to regular	New type, irregular to irregular	Regular to irregular	New type, regular to regular
15	1	0	0	0	0
16	4	1	0	2	0
17	40	3	4	0	4
18	59	3	5	6	6
19	45	4	4	2	5
20	21	2	2	1	1
21	14	0	0	0	0
22	6	0	0	1	2
23	10	0	0	1	1
24	3	0	0	1	0
26-44	21	1	0	2	2

70, or 32 per cent., of the girls in the group changed type.

TYPES OF MENSTRUATION.

Age	Number	Irregular	Regular	
			28 days or less	More than 28 days
15	1	0	0	1
16	4	1	3	0
17	40	11	27	2
18	59	14	42	3
19	45	11	30	2
20	21	3	17	1
21	14	5	9	0
22	6	0	6	0
23	10	1	6	3
24	3	0	2	0
26	1	0	1	0
27	4	1	1	2
28	3	1	1	1
30	6	2	3	1
31	1	1	0	0
32	2	0	2	0
33	1	0	1	0
37	1	1	0	0
44	2	0	2	0

54, or 25 per cent., are irregular; in two the type was unknown.

CONSTIPATION IN RELATION TO MENSTRUATION.

Age	Number	Constipation in whole group			Constipation in unstable menstruation		
		1st exam.	2nd exam.		1st exam.	2nd exam.	
15	...	1	...	0	...	0	...
16	...	4	...	0	...	0	...
17	...	40	...	5	...	1	...
18	...	59	...	15	...	1	...
19	...	45	...	7	...	1	...
20	...	21	...	5	...	1	...
21	...	14	...	2	...	1	...
22-24	...	19	...	7	...	1	...
26-30	...	14	...	4	...	0	...
31-33	...	4	...	0	...	0	...
37-40	...	3	...	1	...	0	...

Considerably more than 25 per cent. of the constipated girls have unstable menstruation.

Between these two extreme groups, stands the great mass of girls, some with only a slight deficiency in one line, and otherwise admirably fitted to reproduce; some with many deficiencies, and only a few chances that their reproduction would be desirable for the race. On our treatment of them in the school depends in part the future of this variable class. By a rational treatment we might be able to eliminate all the undesirable factors except a hereditary taint. I have no doubt that to-day we are dragging down the better types to the lower end of the scale, where by nutritional and nervous faults we make it impossible to get breast-fed babies that can survive infancy and come to effective maturity.

You will at once urge, and I admit, that thorough study of the relationship of menstruation to child-bearing, and especially to the ability to nurse, has never been made. It should be made. So eminent an educator as G. Stanley Hall states in no uncertain terms that in the developmental period in girls everything should be subservient to establishing a normal rhythm. And it seems a rational proposition that the

disturbed nervous and nutritional states that result from abnormal menstruation can have an effect on future reproduction.

There has been a vague impression that college men and women have fewer children than the general population. In the twenty years from 1880 to 1900, two hundred women graduated from the University of Illinois. This is a co-educational school in the Middle West. Seventy-four never married, and the remaining 126 had 235 surviving children, or 1.91 child per marriage, or 1.1 child per woman in the whole group. Of the married, 29 had no surviving children. I have no data on the survival of children of women matriculates of the same period, who did not graduate. Reliable testimony goes to show that they married in at least as great a proportion as the graduates. This proportion corresponds closely to the number married in the whole population of Illinois, according to the census of 1890, but the graduates have a smaller number of children per family than is given in the same census for native-born white women in that district.

In the register published this year of Wellesley, one of the largest women's colleges in the United States, are the records, so far as can be ascertained, of 8,000 women who have been in attendance. The first class graduated in 1879, and from that time until 1900, 4,448 women were in the college. Of these, 2,096 have never married; 1,001 have married but have no surviving children; 1,351 have married and have surviving children numbering 3,138—1,599 sons and 1,539 daughters, or 2.3 children in the families who have surviving children, 1.3 child per family of all the married in the group, or 0.7 child per woman for the group of 4,448. Compulsory education in this school would certainly put Malthus' ghost at rest for several centuries.

The new President of Wellesley, installed last

year, gave her inaugural address on the Making of Citizens. She stated that colleges had nothing to do with parenthood, and the figures from her own college bear her out to quite an alarming extent. There are two or three possibilities on the lack of surviving children from this large institution. It is true that the College is in New England, where the women in the population outnumber the men, but the census of 1890 gives roughly for New England the proportion of seven unmarried women to every ten married ones, while the Wellesley proportion is almost one to one. Did their intellectual acumen make them impatient with the limitations of the minds of men less well educated, less alert? Did their high moral plane forbid their mating with the unfit, and did they have difficulty in finding men with similar standards? The 1,001 families with no children speak eloquently of four possibilities: one, they could not reproduce; two, they could not bring about the survival of their children; three, they were unwilling to undergo the sacrifice, the fatigue, the limitation of intellectual and social pursuits, all necessary for the working out of the vast plan of evolution; four, they could not withstand the economic pressure.

CONCLUSION.

We have to study thoroughly breast-feeding in relation to the educational stresses and child-bearing in relation to menstruation. We have to adjust consistently our schools to the maternal possibility of the girl. If she can really develop with stair-climbing, examinations, music, and multitudinous social distractions, all well and good. If she cannot come to full development under this kind of treatment, we must know it and relieve the strain.

Few schools show constructive ideas on the conservation of the girl's reproductive life. Few schools

fit for mother-craft directly, though here are rays of light.

The educational system was made by and for men, being open to women in its present scope but comparatively few years. If education is really the drawing out of the individual, it must include the perfecting of reproduction; at least you will concede the negative point that education must not destroy so vital a part of the person.

If the tendency of education is, as we believe, toward fuller consciousness and more intense mental and spiritual life, our creative and evolutionary powers must come also into that field. "A house divided against itself cannot stand."

To get infant welfare, survival of a good quality of children, the educator of the girl, physical, mental, and religious, must, each in his own sphere, include reproduction; not only the bare skeleton of the scientific fact, but also its ethical content and eternal relationships.

DISCUSSION.

Dr. SALEEBY expressed his gratitude to the author for having contributed a paper on what was a most important part of the question of education and parenthood. Practically everyone was agreed that there should be education for parenthood, but the question of the influence of their present educational methods upon parenthood was more fundamental. It was no good educating a child for parentage in such a fashion that the result was that she became incapable of parenthood. He had got into a lot of trouble with reviewers from the statements he had made in regard to the matter in his book on womanhood and which were based principally on the work of that great American educationalist, Dr. Stanley Hall. He had been told that the figures he quoted were entirely obsolete and that later figures existed showing that girls who had been educated and had taken most distinguished positions had as many or more children than the average American woman, and were at least as able nurses. He would very much like to know if that was really the case. The educa-

tion of a girl must be to prepare her for womanhood and not to show that at a pinch she could be a boy. Womanhood was the ideal to aim at, and whatever figures might be brought forward in America subsequently it seemed to him almost impossible that anyone on the other side to Dr. Hedger would be able to prove the contrary proposal. If they took Thompson's great book on the evolution of sex they found that there was laid down the proposal that they could only expend as much energy as they had got, and he showed that the female organism, be it human, animal, or vegetable, which was going to give more than the male organism of its energy to the next generation, must by that hypothesis have less energy to expend in some ways upon itself. In other words, they could not eat their cake and have it. It seemed to him there was a legitimate reason for believing that if they extracted by external labour as much energy from the girl as they did from the boy there could not be remitted that extra quantity of energy for future purposes which the woman required. That seemed to him the essential point. Not only in America, but in Europe, there were many figures to show that the strain to which modern woman was being subjected—it might not be educational—was having an effect upon the reproductive system. There was going to be a discussion in the country on the birth-rate shortly, and one of the questions which would have to be dealt with was to what extent the fall in the birth-rate was due to the slow decadence of the reproductive faculty of modern women under modern conditions, and it might be that the failure to nurse was the forerunner of incapacity of parenthood altogether. They had neglected hitherto the problem of the influence of nutrition upon future parenthood, but there was every reason to suppose that it mattered very much.

Dr. SMART (Aberdeen) said it was very easy to be a destructive critic, especially on the question of education, and it required no great capacity for anyone who knew something of education, both in the universities and primary schools as it bore on infantile mortality, to pick holes in it. It was somewhat ridiculous to think they turned out from their highly equipped medical schools young men and women who were able to deal with diseases when the mother called them in, and yet were quite unfit to give instruction in cases that were simply due to faulty nutrition and bad feeding. It ought to be borne in mind that, in training medical students, infant hygiene should receive a much more definite place than it ever had done before, and by infant hygiene he meant ante-natal hygiene.

feeding, and the care of infants. They had heard in one of the papers of the importance of the midwife. Where he came from they had not this great problem of the professional midwife to such an extent as they had in England. But the only way he saw of improving the midwife was to improve her out of account altogether. They did not accept a death certificate unless it were countersigned by a qualified physician, and he held that the poorest woman in the State ought to be able to demand from the State the services of the qualified woman or the qualified man when she was bringing her child into this world. The sooner that came about the better. The point he wished to speak particularly about was the elementary education in schools, but as so much time had been taken up he would only say one thing. If they had to improve the education of the physician let them see that this instruction filtered in the best possible way through schools for mothers, through classes for nurse-girls who had to look after the children of the middle classes (for they had the poorest results often among their better-class patients), and particularly let them see that no girls, especially of the working and artisan classes, who were to be the mothers of the nation, left school without having had, during their last year of school life, the opportunity of learning how to attend to the duties of motherhood.

Dr. TRUBY KING (New Zealand) said he had listened with the greatest possible interest to the admirable address of Dr. Hedger, and the remarks which followed from Dr. Saleeby. It seemed to him that this was one of the fundamental questions about which there ought to be no possibility of doubt. They knew that so far as the race was concerned the health of women was of infinite importance, and after all the essential question, as Dr. Saleeby had said, was that of nutrition. They could concede that there were two fundamental considerations when they were dealing with all living beings, namely, nutrition and reproduction. As Schiller said, "Love and hunger rule the world"; and these were the problems of nutrition and reproduction. But from the scientific point of view there was only one function—that of nutrition—because after all the function of reproduction was only the co-ordinate expression of the function of nutrition. If there was proper nutrition the reproductive function was primarily provided for. If anything was calculated to limit the reproductive capacity of a woman it would be at the time when she was growing most, as she was at the period of puberty, and if she be subjected to excessive strain in directions which did not

make towards the full development of her internal organs. He was not speaking simply of those organs which were called the reproductive but of the whole internal economy. Nothing could be more adverse to the proper development of these organs than if, at the time they ought to be developing, too much attention was paid either to intellectual development or to the development of bone and muscle. They had been told they had to provide the physique, and that when they had also provided the intellect that they had done with the situation. They knew that every evidence which could be brought forward showed them that by these means they had produced a new type. The whole evidence went to show that, even if they produced splendid physique and greater intellect, they had not developed a person capable of the highest function of maternity. The evidence of Dr. Hall was absolutely uncontrovertible, but they need not depend on that evidence alone, because there was plenty of other evidence bearing out the same opinion. There was no doubt that proper education had to be given to the race, and also recreation which was not excessive; but above all there must be a development of a love of human life, an interest in children, and a development of proper womanly qualities at this most momentous epoch of life. Dr. Hedger had told them that in the United States this was not done, and she had given them most glaring instances to show that no attention was paid to proper development. He had seen important schools in his own country where proper lavatories were not provided for the girls which would enable them to have that regulation of the functions of the bowels which Dr. Hedger had told them had such an important bearing on menstruation. In the short time at his disposal, perhaps the best thing he could do was to read a resolution which expressed the opinion of the medical faculty of New Zealand on this subject. He read a paper some eighteen months ago at the general meeting of the New Zealand branch of the British Medical Association, and the following resolution was passed: "That the Hon. Dr. Collins, Dr. Gibbs (Secretary of the British Medical Association), and Dr. Truby King be appointed a committee to wait on the Minister of Education and represent that in the opinion of this Congress it is in the highest interests of the whole community that the State should inculcate and bring about as far as feasible an ideal of education for girls which, to quote the words of Professor Stanley Hall, shall 'invert the present maxim that girls should be primarily trained to independence and self-support, and that

matrimony and motherhood, if it come, will take care of itself.' This Congress feels bound to deprecate any system of education which, under the stress of excessive mental effort, excessive competition, excessive straining after so-called accomplishments, &c., pays insufficient attention to ensuring normal, orderly, well-balanced development and complete fitness for maternity and the practical care of a home. This Congress is satisfied that, broadly speaking, even where marriage does not take place, the education which gives a girl the best all-round equipment in body, mind, morals and inclination for home life and potential motherhood, also gives her the soundest and surest foundation for future health and happiness, and for a sustained power of earning an independent living if such should prove to be her lot." This matter had been before the profession some time and over two years ago Dr. Savage, a leading member of the profession, said: "I can speak in no uncertain terms with regard to this matter, because girls are constantly being brought to me of 12 or 14 years of age and I find them not developed properly, and my practice is to order every such girl away from school for twelve months." The same doctor suggested the gravest doubt whether, under the conditions of modern civilization and modern education, it would not be better if they took them out of schools altogether and turned them loose on a farm for twelve months so that they might develop into natural and proper motherhood. There was an Inter-colonial Medical Congress, embracing Australia, early next year, and so strong was the opinion on this matter that he was specially asked if he would lead the main discussion on the subject of eugenics and education so that no uncertain pronouncement should be given by medical men. He held that normal women were not being produced because of the strain and ruination which was being brought about by the shibboleth of education. What he was asking of that great Conference was their help for the youngest and the smallest of the possessions of that great Empire. He asked the Conference to give support to the resolution which had been passed by the medical profession in New Zealand. And let them remember that he was not speaking simply for the medical profession; he was speaking for the womanhood of New Zealand and for their Society for helping the women and children. Their Society embraced 1,500 of the leading women of the Colony and they wanted to get over the tyranny of the education which was forced upon girls and which they knew was bad enough for the boys. Why could not women be original enough to evolve a system

of education fitted for themselves and disregard that which was totally unfit even for men? Did anyone imagine for a single instant if, as might well have happened, women had first struck upon the idea of education, they would have attempted to impose the same education on boys? If they had they would soon have seen their mistake because boys would have jibbed at it and would not have accepted it. He trusted that they would endorse the resolution he had read in order that they might enable those in New Zealand, who might perhaps be able to turn more quickly sometimes, to do something for the womanhood in that country. He did not know whether it was in order to propose the resolution, but he would like the meeting to endorse it if it could be put to the meeting, as by so doing they would be benefiting the women of New Zealand.

The CHAIRMAN said it had been decided by the Executive Committee that no resolutions should be submitted to the sections of the Conference, but all resolutions would be carefully considered by the Committee, and those which it was considered advisable to bring forward would be submitted to the Conference as a whole on the following day.

Dr. MARY BOOTH (Australia) said she thought that sometimes at Conferences like that they took up too much time in proving the fact of infantile mortality. Dr. Caroline Hedger had made a big step forward in striving to get at the cause of it. She felt so very strongly the truth of the facts which had been brought forward by the author because she had acted as School Medical Officer in New South Wales, and she found that particularly in the High Schools, where girls were of the adolescent age, the effects of over-pressure were apparent in a large majority of the students. As Dr. Hedger said, a few showed no evidence at all, but were full of vitality; their work was easy to them and they left school apparently none the worse for it. But the large majority showed many minor signs of depressed vitality such as headache, loss of tone in the skin, pallor, in some cases mental sluggishness and loss of memory, which was rather extraordinary in girls from 14 to 16 and 17 years of age. When one inquired into their work one found that what would take a bright girl one hour or one and a half hours to do would take these other girls about three hours to do, and although this was supposed to be discountenanced by the head mistress of the school the class teachers could not get control of it. Many of the girls, being at the school at considerable sacrifice on the part of their parents, felt bound to keep their place in the class, with the physical results she had referred to. She concentrated

herself on this aspect of the question for some time. She was there for about two years, and she was sorry to say with practically no result. The assistant teacher had not had the necessary education perhaps to appreciate or thoroughly understand what they were trying to drive home, and would often herself give support to the fact that the girls were at too high a pressure and that the whole system was such that the teacher and the child could hardly escape from it. Therefore one welcomed a statement of the case like this with figures which must alter the whole mental attitude of the education authorities to the physical state of the girls under their care. When they considered that from 20 to 60 years of age women were engaged in some way or another with the care of children it could be realized how very important it was that the few short years of adolescence should not be misused and the whole of that efficiency minimized. They had found that a very rapid physical growth, with increase in height and weight, occurred at even an earlier period in boys and girls in Australia than was the case, according to the figures, in America. That was to say that this physiological high pressure was taking place at a time when the organization was less fit to stand it; and yet they were copying this educational high pressure from other countries, and were applying it even at this early age with, she feared, evil results to the organism. It was a difficulty on which the best authorities differed very much, but if one looked at the facts of physical growth one could not expect boys and girls to work long at the same rate. As Thompson had said, growing up was very hard work, and the whole organism was concerned with its own self-consciousness, and there must be plenty of room and plenty of time for play. With the high pressure of education the girl went home and was busy with her work, and saw nothing of her brothers and sisters. She was divorced from home interests, and therefore lost taste for a contented home life. The education of a girl should develop the sympathy between mother and daughter more than had been the case in the past, yet the education of the High School girl of the present day was creating a divorce between parent and child instead of fostering unity and sympathy, and set the woman seeking for interests outside her home life.

Dr. HEDGER, in reply, said that with regard to Dr. Saleeby's remarks as to subsequent figures, she had been unable to find any figures to controvert her statement. She accepted Dr. Saleeby's statement as to nutrition in its broad sense. It was only a common sense proposition in so

rapidly a growing organism as a girl that if all the impulses and all the circulation and all the nutritional power of the body were going to the head some portion must suffer, and she believed it was the breast and the reproductive organs which suffered under that strain. She was delighted to hear that Dr. Truby King had such support in New Zealand, and wished they had it in her country, but she believed they were not awake on the matter in the United States. She would make a plea from the ethical side, for there was an interest from the point of view of the sacredness of reproduction and the sacredness of life which in her country was terribly unheeded. She was sorry to hear of the high pressure education in Australia. In her country they had a machine system in which they fed the children into the hopper, turned the handle with great rapidity, and in a few months turned out the survivors. She was in hopes that this was limited to her own country, but she feared it was widespread. To show the speed at which they were geared she might say that in a school in which she had been Medical Inspector in Chicago they had about 48 per cent. retardation. Dr. Booth brought out another matter, namely, the separation of the parent and the child. If the English-speaking Colonies could see that higher education could separate the parent and the child then they might realize what it did for the foreign families. A family came over from Poland and the children went to school; in three or four months they were speaking English, and the girls had adopted the dress of the country. At home were the mother and father, neither of them knowing the language, and the mother still wearing her native dress. She became despised. Presently the girl went to work, and she knew dozens of cases in which the foreign mother did not even know where the girl worked. They Americanized too rapidly in her country, and their high system of education was one of the things which was breaking up the family. They took away their foreign standards; they did not recognize their old standards; and perhaps they did not give them any new ones. They did to a certain extent break up the family, and here again came the ethical consideration. Could they throw that great mass of children into their economic life with safety if they took away the restraining hand of the parent? She did not think they could.

ESSENTIAL FACTORS IN THE SCIENTIFIC SUBSTITUTE FEEDING OF INFANTS.

By HENRY L. COIT, M.D.

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THE history of artificial infant feeding in civilized countries is analogous to that of therapeutics: each has had its empirical period; and during this period, like the polypharmacy of therapeutics, there have been forced upon the profession innumerable commercial substitutes for breast milk.

After half a century of plodding research in the pursuit of truth as it relates to infant nutrition, crowded on all sides by ignorance and aggressive commercialism, we are beginning to lay a scientific basis for a satisfactory system of artificial infant feeding. The scientific period began with a group of men notable among whom were Biedert and Meigs, who in 1870 and 1880 taught the importance of accurate adjustment of substitute mixtures, and based their teaching upon the study of woman's milk.

It was ten years later, in 1890, that Rotch of Harvard awoke the American profession from its indifference and gave the first impetus to a general interest in this important subject.

Since then a multitude of workers have contributed to our knowledge; these include the representatives of the German school with others in England and America.

The scientific method is based upon principles evolved from the study of normal infant life. These principles if followed will lead the infant feeder to such generalizations as the following: Never employ any substance not isomeric with its counterpart in the infant's natural food: Have a valid

reason for the use of every element in a food combination: Milk is the natural food for all young mammals, and since the milks of mammals have the same general composition and physical properties, the milk of one should be available for the nutrition of the young of the other.

The factors contributing to success in artificial infant feeding are *intrinsic* and *extrinsic*. The intrinsic factors are found in the individual infant, and consist in its viability, organic integrity, digestive capacity and assimilative power.

These factors must first be determined by the physician and the case, if abnormal, be placed in its proper pathologic group. A correct diagnostic classification is quite as essential to success as in other diseased conditions.

The extrinsic factors are found in the physician himself, the materials employed, the judgment exercised, the temperament of the caretaker, system in the management, and the hygiene of the child's environment.

The physician must combine the qualities of close observation with a clear insight into types of temperament and human nature. He must possess a working knowledge of infant physiology, of infant digestion, of infant pathology, with an ability to recognize minute variations from the normal in his patient; it is also a prime essential, when it exists, that he correct the injurious influence of faulty management and care.

The materials employed are next in order. If these are to simulate the physical and chemical qualities of normal and nascent breast milk, then the logical substitutes are fresh animal milk and its derivatives.

It is significant that MILK is the only material in the whole range of animal matter that is designed and prepared by Nature expressly as food.

Milk is the universal natural food of the infant, therefore for our species breast milk must always be the standard, and in determining artificial methods human milk should constantly be kept in mind. All substitutes for breast milk should approximate woman's milk in physical and chemical properties, and the basis for the successful use of foreign milks is a synthetic adjustment of their differences in composition.

There are as many varieties of milk, so called, as there are different sources of supply, variations in the practice of cleanliness, varieties of animal yielding milk, changes caused by the addition of foreign substances to fortify it, or by its thermic and chemical treatment. Milk of a suitable quality for successful substitute infant feeding will never be obtained until physicians and pediatricians realize that they must expend more energy on this problem than upon any other. Milk fit for clinical purposes can only be secured by unremitting and concerted professional effort, with no lapse of vigilance. After a personal experience of twenty-four years the conviction is forced upon me that it is impossible to obtain milk of a grade required for medical work in the hospital and the home through official or legal control of methods.

Since from 40 to 60 per cent. of our children are at some time deprived of their natural food, the attainment of pure and safe milk becomes the most important material factor in successful artificial feeding and the preservation of infant life.

In the United States the so-called pure milk movement was in the beginning entirely professional and altruistic, and while its influence stimulated the municipal and the federal activities for the betterment of general milk supplies and protection of public health, it still remains in the hands of the medical profession, with the single object of obtaining

milk designed expressly for clinical purposes, and called CERTIFIED MILK.

Nutritive efficiency in milk depends as much on freshness and freedom from foreign contaminations as it does on chemical balance or food values. This is abundantly proven by the injurious effects of contaminated milk even though it is accurately adjusted in percentages and calories.

In the present state of our knowledge, according to Howland, "the superiority of any method of feeding must be judged solely by the clinical results obtained." I have had the care of a large number of feeding cases during the past twenty years (about twelve thousand) with a mortality among several thousand private cases of less than 2 per cent., and a mortality among a larger number of out-patient hospital cases of less than 5 per cent. I am convinced that quality and purity in a very clean and fresh milk, augmented by the purity of the added carbohydrate, has very largely contributed to the success of my cases; during this period I have not once been tempted to abandon my programme for any patented or manufactured substitute.

The milk sugar to which I have had access is by special process subjected to four purifying crystallizations of the market sugar, which renders it free from visible dirt and heat-resistant bacterial toxins.

The mineral salts combined as they exist in woman's milk are an important factor in perfect food metabolism and it has been my effort to add these elements to milk mixtures in a condition of absolute chemical purity.

It is a fatal error to expect the milk of a foreign species to be immediately adapted to and utilized by the human infant; the differences between that of the woman and that of a lower animal would indicate, even when given to the newly born with normal functions, that we must wait until the delicate

digestive and assimilative organs can make use of the material designed for a more vigorous animal.

In infants with injured functions and diseased organs it would seem the height of folly to expect progress in tissue building at once. The functions and organs must be restored, and gain in weight is impossible until progress has been made toward functional and organic integrity. Many a weak baby has succumbed to a normal percentage milk mixture or to one based upon caloric estimations made to fit its weight or age.

Progressive or fractional feeding is indicated by the fact that most of the babies we are called upon to feed are sick, with impaired digestion and atrophied tissues. These sick babies represent varying degrees of fat proteid and carbohydrate incapacity resulting from improper or insufficient food from the breast or the bottle.

For the lack of progressive adjustment premature infants are often sacrificed; in this class slight variations from correct percentages may defeat our object and destroy the child.

In progressive or fractional feeding neither the percentage method nor the caloric method can be disregarded without failure. The one introduced by Rotch and the other by Heubner are both necessary in measuring the efficiency of a mixture; both are essential to accurate progressive adjustment of the food, and enable us to know whether we are underfeeding or overfeeding our patient.

In progressive infant feeding there are two points of procedure. First: The present capacities of the baby to be fed which must be determined. The clamour of the mother for increased weight should be controlled until the powers of the infant to utilize a normal food have been restored.

Second: The normal capacities of the baby if it were well and had attained its maximum growth must

also be determined. These extremes represent the possible dietetic limitations of the patient. When the initial formula designed for the condition in which we find the patient is fixed, it greatly facilitates success to arrange a working formulary in a series, one at the left and the other at the right of the chart, inserting intermediate figures for advancing the changeable ingredients, and for diminishing or increasing the diluents.

In this way it is convenient to write the formulæ on a caloric basis, allowing the caretaker to advance on the estimated increase in weight during the *interim* of the visits for inspection.

Professional judgment exercised in the accurate employment of the food materials is a factor of great importance. The balanced ration will include the proper amount of protein elements to supply the infant's enormous capacity for nitrogen, to replace that lost in the wear and tear on the tissues, and to furnish the building material for growth. It will include the adjustment of the fat so that it will be utilized and thus avoid fat intolerance, the loss of calcium and fat decomposition with its resultant irritants, acidosis and atrophy. It will include the proper estimation of the energy quotient not supplied by fat and proteid, by adjustment of the carbohydrate to avoid the chain of changes so frequently seen in the symptom group, for the clear understanding of which we are indebted to Finkelstein.

Among the extrinsic factors are the temperament of the caretaker, system in the management, and provision for the comfort and hygiene of the baby which may be mentioned together.

There are as many types of mother as of temperament. Motherhood is poetic and beautiful, but in the vicissitudes of modern life, normal maternal instinct, self-poise and resourcefulness have given place in many instances to apprehension and fear with no capacity for good judgment.

The physical interests of the child involve first of all system in the routine care, to secure for it quiet of body and mind, regularity in the hours of sleep, of bathing, of feeding and exercise, with proper attention to manual technique in the preparation of its food: The selection of suitable rooms for its waking and sleeping hours as regards ventilation and sunshine: Thoughtfulness and judgment to ensure proper clothing and bed covering to suit the individual or the temperature.

The mental correspondence of the child and its caretaker will involve the training of its unfolding mind to recognize and not to fear its surroundings; to prevent the lavish waste of nerve force which its sensitive organization is apt to suffer; to train it so that it will learn to govern its own impulses; to isolate it from the excitement too common in the surroundings of little children; to exact obedience with a will tempered by kindness and patience, with a nature characterized by self-reliance and self-control.

We shall thus have gone very far toward guiding the physical development of a normal child and lay the foundation for its life and health.

CONSIDERATION OF THE ECONOMIC USES OF DRIED MILKS AND PATENT FOODS.

By ERIC PRITCHARD, M.D.

London.

THE entire history of dried milk covers a period of little more than ten years. Its application in infant feeding dates from the year 1905.¹ My own experiences began in April, 1908, when I commenced to use dried milk in the feeding of normal infants attending at my infant consultations in Marylebone.

¹ Professor P. Budin, in Paris.

The best known variety of desiccated milk, and the one I first employed in Marylebone, is prepared by the Just-Hatmaker process. By this process the milk is rapidly dried on the surface of revolving cylinders heated to a temperature of 130° to 145° C., and subsequently pulverized. Some manufacturers add glucose, bicarbonate of sodium, chalk, phosphate of sodium, or other chemical bodies, to increase the solubility of the finished product. By these manipulations the physical and chemical properties of the milk are profoundly altered. The whey albumens are coagulated and the caseinogen is so modified that its coagulum takes the form of a flocculent clot not unlike that of breast milk; the fat is partly thrown out of emulsion and floats in large droplets on the surface of the reconstituted milk. When allowed to stand the latter further separates into layers which can be distinguished by their colour and physical appearance. This, no doubt, is due to a change in the colloidal properties of the milk consequent on the absence of soluble whey proteins. Dried milk of this kind dissolves well in hot, but imperfectly in cold water. The net result of these changes is that the reconstituted milk is more digestible than natural cow's milk, a property which makes it valuable in the feeding of delicate infants, but carries with it the disadvantage that it inadequately develops the gastric functions. Although, as regards nutrition, the general results are good, I am inclined to think that infants fed continuously on this milk do not show the same vigour and vitality which are shown by infants supplied with natural milk, or with a dried milk which approximates more closely to the raw product. Although cases of scurvy have not been reported by others who have made use of this variety of dried milk, I have myself seen cases which, on the principle that "*Naturam morborum curationes ostendunt*," must be regarded as mild examples of the disease.

A second variety of dried milk is desiccated by a somewhat similar process, but at a lower temperature, *i.e.*, 90° to 94° C. In this case the milk is first concentrated *in vacuo*. The milk produced by this method stands, as regards solubility and digestibility, midway between the afore-mentioned milk and the variety I am about to describe.

The third and newest kind of desiccated milk is manufactured by the Bévenot-de-Neveu process, a process which, in my opinion, is calculated to place the whole question of dried milks on quite a new footing. Bévenot-de-Neveu milk when reconstituted with its appropriate proportion of water is almost indistinguishable from natural milk. The process requires that the raw milk after concentration *in vacuo* at a low temperature should be forced at high pressure (150 atmospheres) through exceedingly fine perforations in a metal disc. The resulting spray of nebulized milk is then surrounded by an envelope of hot air and carried across a drying chamber in which it is almost instantaneously desiccated. The solid constituents of the milk fall as a snow-like powder to the bottom of the chamber, and the water is carried off in a cloud of vapour. By this process milk can be dried at quite a low temperature. The particular variety of milk I am now using is desiccated at 70° C., and in it the whey albumens are not coagulated nor the caseinogen in any way altered. On standing, the cream slowly rises to the surface as in natural milk; and the clot formed by rennet is the same as that afforded by raw milk. Further, the enzymes are not destroyed, and the so-called vital principles (*vitamines*) have been isolated from commercial samples of the milk.¹

From the above descriptions it will be readily understood that all desiccated milks must not be

¹ Dr. Jane Lane-Claypon: Report to Local Government Board on Biological Properties of Milk, 1913, p. 83.

classed together. As far as infant feeding is concerned, one variety of milk may be quite suitable in certain cases though quite unsuitable in others, so that different milks cannot be interchanged without incurring risks. For instance, delicate babies with enfeebled powers of digestion may thrive well on milk No. 1, and fare extremely badly when given milk No. 3. While strong and vigorous infants, in my experience, flourish better on milk No. 3 than on milk No. 1, I invariably make an effort to develop the functions of digestion up to a point at which there is tolerance of the less digestible variety. This I generally succeed in accomplishing by a gradual substitution of milk No. 3 for milk No. 1, or perhaps more satisfactorily after first feeding the infant on dried whey, also prepared by the Bévenot-de-Neveu process—and similar in all respects to freshly prepared whey—by gradually introducing the dried milk into the whey solution.

Dried milks prepared by any of the above-mentioned processes are usually supplied in three qualities, which differ considerably in price: (1) Full cream; (2) half cream; (3) separated milk. Some manufacturers supply yet a fourth variety, which is modified to a standard which is supposed to be suitable for the feeding of infants. Although it is well within the range of possibility to desiccate milk which has been previously modified to the human or any other required standard, no milk fulfilling the required conditions of infant feeding has, up to the present, come under my notice.

From the point of view of purity and freedom from bacterial contamination, desiccated milk is superior to ordinary dairy milk. In the first place, a good dried milk can only be prepared from an initially good raw milk. In the second place, after the milk has once been packed in hermetically sealed tins it is liable to no subsequent contamination. Dairy milk,

on the other hand, continues to deteriorate from the moment of milking to the moment of consumption. Milk can be desiccated and sealed up within three or four hours after it has left the udder of the cow. Although, theoretically, it is possible to produce a germ-free dried milk—as a matter of fact an average sample contains between 4,000 and 10,000 germs per grammé weight—when reconstituted with water the bacterial content amounts to 400 to 1,000 living germs per cubic centimetre as compared with 6,000, to 100,000 in the best samples of dairy milk. A more important feature is that among the germs present there are no tubercle bacilli or other pathogenic varieties. From the point of view of summer diarrhœa this is of paramount importance. During the fatal summer of 1911, among all the babies attending at my clinics fed on dried milk, I had no deaths from diarrhœa, and such cases as occurred were of the mildest possible type.

Economic Advantages—When compared with the cost of dairy milk, reconstituted dried milk has no advantages, the cost of the two varieties are practically the same, *i.e.*, 4d. per quart. There is, however, this to be said in favour of dried milk, that there need be no waste.

In the following table I have calculated the actual cost of feeding infants on different classes of food; these classes include two proprietary foods three grades of dried milk, modified cow's milk, and a combination of separated dried milk with an emulsion of linseed oil (Marylebone cream), and sugar.

As the basis for my calculations I have assumed that the infant is 3 months of age, weighs 10 lb., and is normal in all other respects. I have further assumed that for every pound of bodyweight such an infant will require sufficient food to produce 40 calories in the twenty-four hours, or 400 calories in all—possibly a low estimate. I have calculated in

each case the amount of food which will produce this number of calories and the actual price that must be paid for these quantities.

TABLE A.—TO SHOW DAILY AND WEEKLY COST OF FEEDING INFANTS ON VARIOUS CLASSES OF FOOD.

	RETAIL		WHOLESALE	
	Daily cost A	Weekly cost B	Daily cost C	Weekly cost D
Proprietary infant food, No. 1 ($2\frac{3}{4}$ oz.—78 grm.)	s. d. 0 5	s. d. 2 11	s. d. 0 4	s. d. 2 4
Proprietary infant food, No. 2 ($3\frac{1}{4}$ oz.—92 grm.)	0 8	4 8	0 $6\frac{1}{2}$	3 $9\frac{1}{2}$
Dried milk modified for infant use (3 oz.—85 grm.)	0 $3\frac{1}{2}$	4 1	0 $2\frac{3}{4}$	3 3
Full fat dried milk ($2\frac{3}{4}$ oz.—78 grm.) ...	0 $3\frac{1}{4}$	1 $10\frac{3}{4}$	0 $2\frac{1}{2}$	1 $5\frac{1}{2}$
Half fat dried milk ($3\frac{1}{4}$ oz.—92 grm.) ...	0 $2\frac{1}{4}$	1 $3\frac{3}{4}$	0 2	1 2
Dried whey ($3\frac{3}{4}$ oz.—108 grm.) ...	0 $8\frac{3}{4}$	4 $11\frac{1}{2}$	0 $6\frac{3}{4}$	3 $11\frac{1}{4}$
Modified cow's milk (milk, cream and milk sugar)	0 $3\frac{1}{2}$	2 $0\frac{1}{2}$	0 3	1 9
Separated dried milk with added Marylebone cream and loaf sugar ($1\frac{1}{2}$ oz., $\frac{1}{2}$ oz., 1 oz. 3 drms. respectively)	0 2	1 2	0 $1\frac{1}{4}$	0 $8\frac{3}{4}$

In columns A and B the cost is estimated on retail prices; in columns C and D on the cost to institutions buying in bulk.

An examination of the above table shows that the most expensive foods are whey and proprietary food No. 2. To feed a baby for one week on these foods costs 4s. $11\frac{1}{2}$ d. and 4s. 8d. respectively. The same baby may be fed on full cream desiccated milk for 1s. $10\frac{3}{4}$ d. per week, or cow's milk modified to the standard of human milk for 2s. $0\frac{1}{2}$ d., or on separated dried milk modified to the human standard with added Marylebone cream and loaf sugar for 1s. 2d. These costs are based on retail prices, but if the same foods are bought in bulk, as hospitals and other institutions are in a position to do, the economical advantage of separated dried milk over other methods of feeding is still more strikingly borne out. The cost to institutions of feeding a baby on separated

milk supplemented with Marylebone cream and sugar is 8 $\frac{3}{4}$ d. a week, whereas to feed it on fresh cow's milk modified to the human standard approximately costs 1s. 9d.

Calorie for calorie, separated dried milk is the cheapest food which can be purchased, but of course, it is quite unsuitable for infant feeding unless it is fortified with additional fat to replace the cream which has been abstracted. The cheapest fat that can be employed for this purpose is linseed oil; linseed oil can be made into a most palatable emulsion and sold at 3s. 8d. per gallon,¹ a price which compares with 16s. per gallon for cream containing the same percentage of fat.

As far as I am aware the nutritive qualities of an emulsion of linseed oil (Marylebone cream) are in no respect inferior to those of cream, although their constituent fats are not identical.

For some time past I have experimented with this method of feeding, and I find that infants fed on separated milk reconstituted with water and fortified with Marylebone cream and sugar make just as good progress as do infants fed either on whole cream, desiccated milk, or other more expensive foods.

Although it is of importance that infants should be supplied with a food which affords a sufficient number of calories per pound of bodyweight, it is by no means a matter of indifference how the calories are afforded.

There is an optima ratio for the three main elements of an infant's dietary. I think it safe to conclude that in breast milk these elements are combined in a ratio which conforms to the physiological requirements of the average infant. In breast milk

¹ Sold by The British Drug Houses under the name of Marylebone Cream at 3s. 8d. per gallon.

the percentage composition is 1·5 per cent., fats 4 per cent., sugars (carbohydrate) 6·5 per cent. These proportions are not observed by any of the desiccated foods with which I am familiar, as may be observed by an examination of the following table. For the sake of comparison I give the percentage composition of desiccated breast milk, which I take as the standard, and beneath them I arrange in series the composition of the various desiccated foods above referred to.

TABLE B.—PERCENTAGE COMPOSITION OF PROPRIETARY INFANT FOODS AND DRIED MILKS.

	Protein	Fat	Sugar	Ash	Water
Approximate standard required in a desiccated food for average infant, <i>i.e.</i> , desiccated-breast milk	12·5	27·5	56·0	2·0	2·0
Proprietary infant food, No. 1	9·7	20·0	60·85	3·75	5·7
" " " No. 2	16·35	8·78	69·95	3·86	3·06
Dried milk modified for infant use	21·33	14·51	55·23	7·48	1·45
Full fat dried milk	26·44	28·0	38·92	5·87	0·77
Half fat dried milk	33·3	15·1	39·7	6·9	5·0
Separated dried milk... ..	33·9	1·0	55·0	8·2	1·9
Dried whey	14·25	0·27	74·45	9·8	1·2

Dried milks cannot be employed to the best advantage without modification, any more than cow's milk can be so employed. They all contain too much protein and not enough sugar. To enable them to conform to the required standard they must be reconstituted with more than their original proportion of water and must be supplemented with added sugar and cream.

To emphasize how inappropriate these foods are without modification I give in the following table (C) the percentage composition of all the foods referred to above when they are diluted with the amount of water required for twenty-four hours.

If these diluted foods are compared with breast milk it will be noticed that all the dried milks contain an excess of protein and a deficiency of fat

and sugar. The proprietary foods contain too much sugar and too little fat. The percentage composition of the mixture prepared from separated milk, Marylebone cream and sugar also departs from the standard of breast milk, but without any increase of cost it can be made to conform to any required standard by varying the proportions of the components. I find from experience that 4 per cent. of fat is too high for the majority of infants, and 1·5 per cent. of protein is needlessly low. With a mixture of the above percentage composition I get most excellent results, 20 oz. of such a mixture provides 400 calories, enough for an infant 3 months of age, weighing 10 lb.

TABLE C.—PERCENTAGE COMPOSITION OF PROPRIETARY INFANT FOODS AND DRIED MILKS WHEN DILUTED WITH 20 OZ. OF WATER: 20 OZ. OF EACH PROVIDES 400 CALORIES.

	Protein	Fat	Sugar
Breast milk	1·5	4·0	6·5
Proprietary infant food, No. 1 ...	1·3	2·7	9·2
" " " No. 2 ...	2·6	1·3	14·5
Dried milk modified for infant use ...	3·3	2·2	8·5
Full fat dried milk	3·6	3·5	5·0
Half fat dried milk	4·8	2·2	5·8
Separated dried milk	5·8	0·16	9·4
Dried whey	2·4	0·04	13·0
Separated dried milk with added Marylebone cream and loaf sugar	2·5	3·5	6·2

The formula for preparing 20 oz. of this mixture is as follows:—

Separated dried milk	...	...	...	1½ oz.
Marylebone cream	...	...	...	1⅓ oz.
Sugar	...	...	...	½ oz.
Water	...	...	...	to 1 pint.

Such a mixture is not suitable for all infants, but it is the goal at which we should aim, and by the careful training of the digestive functions by a preliminary course of modified whey mixtures it is a goal which it is very easy to reach.

CONCLUSIONS.

(1) Different varieties of dried milk have different properties and are suitable for different classes of cases.

(2) Dried milks are free from pathogenic germs, and consequently safer than natural milk.

(3) The cost of reconstituted dried milk is the same as dairy milk, but if separated dried milk is used and fortified with a cheap substitute fat (Marylebone cream), the food thus constituted is the cheapest that can be employed and the results are excellent.

(4) Proprietary foods are expensive and do not accurately conform to the standard of breast milk.

(5) To obtain the best results with dried milks they must be modified to the required standard—a standard which differs in the case of different infants. This is easily accomplished by varying the dilution and adding varying proportions of additional fat and sugar.

The CHAIRMAN said he thought that one of the best ways of dealing with summer diarrhoea was by the use of dried milk. The trouble of the poor was their poverty, for they were too poor to be able to keep their milk supply in the sort of way which most people in that room would keep their food supplies. He was not at all sure but that one of the great means of escaping their summer diarrhoea difficulties was not along the lines of dried milk.

THE USE OF DRIED MILK.

By A. E. NAISH, M.A., M.B.CANTAB., M.R.C.P.LOND.

Sheffield.

THE essentials of a good artificial food are (1) That it should be digestible; (2) that it should contain the right proportion of assimilable substances to build up a healthy body; (3) that it should not contain bacteria of such numbers and kinds as to

cause disease, and (4) that it should not be too expensive or difficult of distribution. To the mother the first essential seems the most important, to the Public Health Authority the third, while the second perhaps looms most largely on the horizon of the clinician. I need scarcely say that a universally suitable food is as impossible of attainment as the philosopher's stone, yet perhaps too little attention is paid to the idiosyncrasy of the infant. Of breast-fed twins of approximately the same birth-weight you may sometimes find that the one wastes while the other thrives. The presence of two variables (the baby and the food) often clouds our judgment; one baby acts as an advertisement for a food on which the majority of its compeers would develop rickets; another is the graveyard of the reputation not only of several excellent foods, but of that of the medical man in attendance. In arriving at a sane judgment on the merits of a food, full allowance must be made for the variability of the human media.

Before inquiring further into the suitability of various foods for extensive use, it is well to try to estimate the magnitude of the problem of artificial feeding. In consequence of the Notification of Births Act, and the visits that are paid to the homes of the poor by women sanitary inspectors, we are able to estimate more accurately than formerly what proportion of infants are being artificially fed. In Sheffield during the year 1910, it was found that reliable data on this point could be obtained from a total of 6,216 cases. Of these 3·5 per cent. were artificially fed from birth, a further 10·2 per cent. were weaned before the end of the first month of life, and a further 10·9 per cent. before the end of the third month. Making a rough estimate on this basis, it may be reckoned that in the whole city, which contains less than half a million inhabitants, there will be over 470 infants each year who are bottle-fed from

birth, over 1,800 before they reach one month old, and over 3,300 before three months. (This estimate is probably a little low, since weaning is least common in the class from which the statistics are drawn.)

It is the desire of all of us to increase the proportion of breast-fed infants, but in view of the facts that there is no unwillingness, but rather the contrary among the poorer mothers, and that in Sheffield there is a minimum of industrial employment for married women, it is not likely that for some years at any rate there will be a material improvement over the figures given above; though increasing knowledge of the causes of weaning may effect a gradual change. Any scheme then which aims at improving the nutrition of the infant population by means of altering the artificial food in common use, must be prepared to deal with large numbers. Considerable modifications of cow's milk, such as whey, cream, milk and sugar mixtures are rendered inapplicable on any large scale by reason of the expense of manufacture and distribution.

There is general agreement that, as far as our knowledge goes at present, cow's milk in some form or other should constitute the basis of the feeding of the great majority of infants who cannot be breast-fed, yet it is futile to deny that cow's milk has fallen into some disrepute among the mothers themselves. Not all the wiles of the patent food advertisers would suffice if feeding with cow's milk were such plain sailing as some would have us believe. The maternal mind is often unable to trace nutritional diseases such as rickets, or bacterial infections, to their true source, since the causal relationship is slow or indirect, but an indigestible food has such immediate and obvious results that the mother is a good judge on this point. On the other hand, a medical man, because he has excellent results with some form of food in the preponderating number of infants attending his clinic, cannot on this evidence alone say that this is

digestible by the majority of infants. There is abundant reason to believe that although the doctor may not select the cases himself, yet that there is a natural selection going on all the time: the mother who finds her baby crying and vomiting on the first trial of the nutriment, quickly absents herself and the baby, so that only the successes tend to appear among the regular attendants; this at any rate until the clinic has attained a certain amount of popularity, when some moral hold may be had over the mother even though the baby's symptoms seem to her unpropitious. I fear that cow's milk must stand convicted of having caused indigestion in a considerable proportion of infants fed on it, especially among those weaned very young. The casein has been largely blamed for this, but latterly in some quarters the tendency has been to stigmatize the fat or the added sugar, and to claim that when given undiluted and without sugar, digestive troubles are eliminated. Personal experience apart, it would seem extraordinary that so simple a clue to success as giving the milk without additions should have escaped the observation of generations of mothers, if this method were at all universally applicable.

There is no doubt that in a great number of cases dried milk is strikingly more digestible than ordinary milk, and that this is not due to the absence of cane sugar is proved not only by the history that some of the infants have previously had no excess of this, but by the Leicester experience where they add cane sugar to dried milk, and further by the fact that in certain cases you may bring back the old symptoms of colic and vomiting by adding less than a teaspoonful of raw milk to the dried milk feed. This difference in digestibility is what strikes the mothers at once, and it is an extremely common thing to hear them say after the first week's trial, that the baby has ceased vomiting and "rested better" than ever

before in its life. If this amelioration of symptoms were purchased at the expense of the child's ultimate good nutrition, a great mistake would be made. It thus behoves the medical man to proceed with great caution until he is sure that it has no tendency to produce rickets or scurvy. Taking rickets first, since it is possible in some cases to cure the disease by a change on to a dried milk diet, it is obvious that in these cases the necessary nutritional elements are capable of absorption and assimilation. This, however, is not proof that in other cases rickets may not develop or even be a fairly common consequence of taking this food, for there is great variability in infantile powers of absorption and assimilation. The point can only be settled by direct observation, and here it is that the observer must be sure that he has a clear mental picture of what is known as rickets. Bony deformities, though striking in appearance, are among the less important signs of the disease, since the earlier and more severe cases show comparatively little outward bony deformity. Unfortunately most of the other signs are not so capable of accurate registration. The time, however, when independent walking is first accomplished can be registered exactly, and I regard this as excellent evidence of the presence or absence of early rickets, since this disease profoundly affects the tone of the muscles and prevents the infant standing or walking till long after the normal time. I have followed up considerable numbers of those fed on dried milk, and noted the time at which independent walking commences; this I have found to be usually within fourteen months, except where the infant has been very far from the normal at the time of its first attendance or has suffered subsequently from measles, whooping cough or other bacterial infection; in not a few cases the child has walked before the end of the first year, and in

one case at nine months. I have also followed up as many as possible to the ages of three, four, and five years, and am personally convinced that there is no more risk of rickets with this diet than with a good quality raw cow's milk. Exceptional cases do occur, but they are almost invariably capable of a ready explanation. For instance, mothers occasionally manage to escape through the meshes of our careful oversight, and are found to be giving some of the food to an older child, or for some other reason underfeeding or neglecting the baby. Then twins are particularly liable to pallor, muscular flaccidity and irregular growth of the cranium, which is largely independent of their diet; and this condition is not confined to twins, but may appear in isolated cases or in several members of a family, especially where the mother is liable to hyperemesis and other troubles during pregnancy. Such cases may appear on any diet, even on breast milk of good quantity and quality.

With regard to scurvy, I believe the risk is non-existent. I did see one slight case two or three years ago, which was cured within three days, but the mother in this instance had been attending very irregularly, and I was never able to satisfy myself as to what the baby's diet really had been. Besides this I have seen no other, and I am not in the habit of ordering any orange juice or other anti-scorbutic.

Since the finding of so-called "biological substances" in raw milk, there has been a strong feeling in favour of giving milk without any heating beyond body temperature. Dr. Janet Lane-Claypon, however, after a full analysis of all the work that has been done on this subject, besides original work carried out by herself, has shown that the advantages claimed are illusory. She shows that the "ferments" are almost wholly due to bacterial action, and that the minute quantities present in "pure" cow's milk are not only

of no use to digestion, but are already present in larger quantities in the infant's own blood; further that the "protective substances" only appear in milk when the mammary gland is not in full activity, and even when present are destroyed in the child's intestine after the first few days of life. This thorough investigation will help to remove from the minds of many of us the uneasy feeling that by cooking milk we are depriving the child of some unknown living substance which is necessary to its perfect development.

Turning to the difficult subject of the bacterial content, I do not think that much can be said with certainty so far. Most people would be inclined to give dried milk a high place, owing to the very small number of organisms in it. I am not sure, however, whether the vigorous growth of lactic acid bacilli which occurs in freshly drawn milk is not of advantage to the child in the continuous bacterial warfare of its intestine. This of course does not apply to milk as ordinarily delivered at the house, and the advantage may be easily and cheaply attained in dried milk by the addition of a freshly prepared culture in small quantity to each feed. I have had striking evidence of the value of this addition, infants with pallor, sweating, loss of appetite and offensive stools showing almost immediate amelioration of their symptoms and beginning to put on weight rapidly.

To sum up: we have in dried milk a food which contains the same substances as cow's milk and in the same proportions (except when humanized), which is digestible to a wider range of infants, which has obvious advantages of storage and distribution, and which appears to have no tendency to promote any of the later nutritional disorders.

THE WET-NURSE PROBLEM.

By FRITZ B. TALBOT, M.D.

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THE wet-nurse problem, at first sight, seems simple and separate from the other social problems which come to our attention. On closer study, however, it is found to be connected with many of the great problems of the day, such as that of infant mortality, the social question, and the problem of illegitimate children.

The phase of the wet-nurse problem which interests the practising physician most is "how can a wet-nurse be obtained quickly?" Wet-nurses are used extensively, both in hospital work and private practice, in the United States: for example, out of eighty physicians¹ who answered a circular letter sent to them by the writer, only eight did not use wet-nurses at all. Most of the seventy-two remaining physicians used six or more a year and one has used in his private practice an average of twenty-five a year for the past two and a half years. Breast-milk is often necessary to save a baby's life and in such instances must be obtained quickly. The writer has travelled many miles and spent many hours in the past hunting for wet-nurses. This time was wasted in many instances and it seemed to him that if some central agency or directory could be established it would serve the double purpose of bringing the demand and supply together. It was found, on inquiry, that an attempt had been made in the year 1900 to have wet-nurses registered at the Directory for Trained Nurses in Boston, but that none had ever registered. This attempt was unsuccessful, as have been other similar

¹ Evenly divided among pediatricians and general practitioners.

attempts that have come to the writer's notice. The explanation is simple because the majority of women who wish to become wet-nurses are destitute, and cannot afford to wait for a position because they need money immediately for their bread and butter. They have, therefore, to wean the baby, put it out to board, and go to work.

There is a wet-nurse agency in the city of New York run by private individuals, where wet-nurses can be obtained by paying a fee of ten to twenty-five dollars. These agents also take an unknown percentage of the wet-nurses' first month's wages. The babies are placed out to board, and the writer has been told on good authority that 90 per cent. die. Although these wet-nurses are satisfactory to the families, and a great deal of trouble may be saved, no right-minded person who knows the facts should allow the baby to be separated from the mother for the convenience of the family or for selfish reasons.

The following is a description of the essentials for a directory and home for wet-nurses : first, the directory should be run in connection with some babies' hospital where the problems of breast-feeding are understood, and secondly, there should be no charge for the board of the wet-nurses because they are nearly all destitute. The average length of time that they have to wait for a position is fourteen days, and they could not afford to wait so long if they were not helped in this manner. The natural result when such an opportunity is afforded is that more women are able and willing to wet-nurse.

On February 1, 1910, a Directory for Wet-nurses¹ was opened in Boston under the supervision of the Massachusetts Babies' Hospital. A moderate sized

¹ See Talbot: A Directory for Wet-nurses: its experience for twelve months. *Journal of the American Medical Association*, June 10, 1911, vol. lvi, pp. 1715-1717.

house was selected, which contains a kitchen, sitting-room, and five bedrooms, four of which are fitted to accommodate two wet-nurses apiece and their babies, while the fifth is for the matron. The next problem was to find wet-nurses so that when the demand came there would be a supply. This was accomplished in two ways: first, the majority of wet-nurses were obtained through the various maternity hospitals in the city of Boston. One of the serious problems of these hospitals is to look after the destitute mothers and babies in such a manner that they will not be dependent on charity after they have ceased being obstetrical cases. This is impossible in many instances. The mothers and babies are either allowed to shift for themselves and are probably separated, or else they remain in the hospital, where their presence prevents the admission of some other worthy case. As there are very few occupations open to a mother with a newborn baby, wet-nursing is pre-eminently fitted to these cases. The maternity hospitals, therefore, find the Directory a valuable adjunct to their work, both because it takes the place of a convalescent home, and because it supplements the social work that they are trying to do. Most of the wet-nurses are glad of the opportunity for honest work and very few have to be urged.

Second: Eight thousand postal-cards were sent to physicians in New England stating that wet-nurses might be obtained from the Directory and also requesting them to send to the Directory any women who were suitable to become wet-nurses. This was intended to create a demand as well as a supply. A fee of ten dollars was paid to the Directory for supplying the wet-nurse, and eight dollars a week to the wet-nurse in wages. The baby accompanied the mother in every instance.

Requirements for Admission to the Directory.—Before a wet-nurse is formally admitted to the

Directory, the following tests and examinations are made: a complete physical examination of the mother and the baby, including the hair, mouth, throat, heart, lungs, breasts, glands, skin and bones, to exclude contagious diseases, tuberculosis and syphilis; the mother's blood is taken for a Wassermann reaction; and finally a smear is taken of any vaginal secretion and examined for gonococci (it is probable that the gonococcus complement-fixation test will eventually be performed on all cases). If all these examinations are satisfactory, the woman is admitted and is ready for a position. During the three years that the Directory has been running, it has passed one hundred and forty-seven wet-nurses. Seven others were not accepted, two because of tuberculosis, one gonorrhœa, and four syphilis (one of these women had a perfectly normal physical examination but was found to be specific by the Wassermann test). Five other women passed the physical examination but were unsuitable for wet-nurses because of insufficient breast-milk. The wet-nurses are only allowed to go to a household in which the family practitioner guarantees that there is no danger to the health of the wet-nurse or her baby.

Finances.—Originally, a fee of ten dollars was charged by the Directory for supplying wet-nurses; the income from this fee was used to pay the running expenses, the balance being raised by private subscription. Although some people could not afford to pay the full fee, many others were willing to pay more; consequently this year the fee was raised to twenty dollars. It is estimated that this, with an additional source of income in the sale of drawn breast-milk at 25 cents an ounce, will pay nearly all the expenses and the Directory will soon become self-supporting. During the past year about sixty quarts of drawn breast-milk were sold to families in which a few ounces were needed to tide over a critical period.

There can be no doubt that the facility in obtaining this breast-milk in small amounts saved many babies' lives. The average expenses for running the Directory have been about 1,300 dollars a year. This includes the board and lodging of the wet-nurses, the salary of the matron (but not the salary of the social worker), and other incidental expenses.

Up to date the majority of the wet-nurses have been *primiparae*, their ages varying between 18 and 30 years. Among the occupations represented were ladies' maids, mill operatives, and school girls; 85 per cent. of them were single (of the 125 single women, five were married under the care of the Directory).

The writer anticipated that there would be a large demand for wet-nurses during the fall and summer months, and was surprised to find a steady, though less marked, demand throughout the rest of the year. Many wet-nurses received a position the first day they were admitted to the Directory, but this was not encouraged because the Directory desired to teach them some of the principles of the care of their own babies before they were sent out in a position. They were also taught light housework.

The wet-nurses were not allowed to take a position in any instance without their babies, and the Directory has been able to accomplish a great deal both for the women and their babies by living up to this rule. It was made for two reasons: first, it is well known that the amount of milk secreted in the normal breast depends in great part on the demand and supply. Usually, when it is necessary to get a wet-nurse, the sick baby is so feeble that in the beginning it is only able to take small amounts of milk. Thus, the demand being reduced, the milk tends to dry up. When a wet-nurse is sent from the Directory, she understands that the sick baby is to be nursed first, and that her own child can have what is left. The mother has

frequently been able to completely nurse both babies when the demand has been increased in this manner. Secondly, the mother is usually happier when she has her baby with her, and is thus more easily handled. And lastly, New York has found that when babies are separated from their mothers, about 90 per cent. die ; while of the babies that have been under the care of the Directory there has not been a single death up to date (one baby whose mother was wet-nursing in the hospital died during this time). The principal factor which is responsible for these results is that the baby is kept with its mother.

During the period of wet-nursing the growth of the mother's character is often remarkable ; the nature of her work allows her a great deal of time with her baby, and as a result she develops the responsibility of motherhood. She comes to the Directory burdened with the shame of her position and without any hope for the future. She finds that other people have been in a similar position, and with the help of the Directory have found a new start in life. In some cases she sees the love and anxiety of the mother of the sick baby, and as a result her own sense of motherhood begins to develop. With it comes self-respect, because she is earning her living honestly. After the first position is ended she always comes back to the Directory, either for another position or for advice for her future. Sometimes she is able to wet-nurse in several families, and many women have saved 150 to 200 dollars with which to start in life. In those instances in which the mother is separated from the baby she usually deserts it at the first opportunity, with the result that another baby starts life in an institution and is supported by the public.

The *social worker* takes an important part in the work of the Directory. She tries to learn the woman's true story, becomes her friend, confidant, and adviser. She is often able to get a settlement from the child's

father. After the woman has finished wet-nursing, she finds her a position with the baby if possible, and if not finds a suitable home for the baby where the mother can see it daily. She keeps in close touch with the mother and helps her in every way possible.

Summary.—The wet-nurse problem can be solved by establishing such a Directory as has been outlined above. It is probable that such an institution can become self-supporting. The secret of success lies in widely advertising the fact that wet-nurses can be obtained quickly, and in giving the prospective wet-nurse a place where she can live without expense until she obtains a position. Infant mortality can be lowered from about 90 per cent. to a minimum by insisting that they are not separated. The Directory for Wet-nurses gives these babies an opportunity in life which they could not get otherwise, and makes it possible to save the lives of many babies that would otherwise have died.

DISCUSSION.

Dr. BREITMANN (Russian Medical Press) said that the cause of infantile mortality was artificial feeding, and in Russia the death-rate was similar to that which they got with soldiers in war.

The CHAIRMAN asked why there was such a high mortality in Moscow and St. Petersburg.

Dr. BREITMANN said the chief cause was the bad milk. If they took the text-books on infant feeding almost every author aired his own method and criticized the methods of others, and many physicians used patent foods, not one of which had the composition of human milk or cow's milk. He did not recommend any special method, but wished to be individual in every case.

Dr. HELEN MACMURCHY (Toronto) said she was specially interested in the paper of Dr. Talbot, firstly because it seemed to her that the nursing of the child by the mother was a thing they had not appreciated. She was so interested to hear Dr. Talbot say that the work of providing wet nurses in Boston by an organization had also turned out to be the basis of a great social work. They were always

trying to treat people as something less than human beings, and that was wrong. The right view was, as Dr. Talbot had described, to take the unmarried mothers in. What they had been accustomed to do was to run away from the unmarried mothers, but this had not been successful, and so they must try the better way and treat them as human beings.

Dr. KERLEY (New York) said he would like to ask Dr. Pritchard whether or not he had any scurvy by the use of the dried milk. With regard to Dr. Talbot's paper he thought the author deserved a tremendous amount of credit for solving the very difficult wet-nurse problem, and they appreciated that a great deal of work and time must have been expended on such an arrangement as he had got. Whether it would be practicable for larger towns he did not know. Where he took exception to the author was that he gave them a very high mortality for wet-nursed children. He did not know the doctor's authority, but the statement was quite a reflection on the way in which doctors in New York took charge.

Dr. SCURFIELD asked Dr. Pritchard if he had made any examination of dried milk with regard to the enzymes. Were they altered at all?

Dr. TALBOT said that with regard to the mortality of wet-nursed children he was quoting Professor Hopkins and Dr. Holt, although he must say that Dr. Holt had said that the conditions were much better now in the last two or three years than previously. He had been rather suspicious of the figures, and he purposely said "on good authority." It seemed a tremendous mortality, but they agreed that the mortality amongst these babies was very high.

Dr. PRITCHARD said that in regard to the question of Dr. Kerley about scurvy, so far as his experience went he had only seen a few cases of very mild scurvy when fed with milk prepared by the Just-Hatmaker process. Bévenot-de-Neveu milk had been examined for enzymes, and they had not been found altered in any way.

ON ARTIFICIAL FEEDING OF INFANTS
BY CITRATED WHOLE MILK.

BY FREDERICK LANGMEAD, M.D., F.R.C.P.

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IN spite of the work of the German school, who ascribe to the fats and sugar of cow's milk the chief difficulties met with in infant feeding, most English observers still hold that the protein is the greatest offender. Fat indigestion undoubtedly occurs, and that more frequently than was formerly supposed; but the firmness of the casein curd of cow's milk is still the most important difficulty to be combated.

A consideration of the differences between cow's milk and human milk suggests two obvious explanations of the greater toughness of the curd of cow's milk. One of these is the greater proportion of protein in cow's milk, and the relatively greater proportion of casein to lact-albumin; the other is the excess of calcium salts. Until recently, the former of these has monopolized the attention of the profession. To eliminate it, cow's milk has been diluted, thus diminishing the amount of casein, and reducing the size and, to a certain extent, the density of the curd. A recognition of these truths has originated the method of feeding infants by diluted cow's milk, a device which, of all others, is most in vogue at the present day. Little heed has been paid to the other explanation of the greater density of the cow's milk curd, namely, the larger proportion of calcium salts. Bunge gives the proportion of lime salts in human milk as 0.03 per cent., and in cow's milk as 0.17 per cent. Remembering the effect which calcium salts produce on coagulation, we have a ready explanation of the tough curd. The question which naturally follows is: "Can the excess of calcium salts be eliminated?" Sir Almroth Wright, in 1893, showed

that the density of the curd of cow's milk can be modified profoundly by the addition of sodium citrate. This can be demonstrated by a simple experiment. Let three test-tubes be taken and an equal amount of cow's milk be poured into each. Slightly acidify the milk in each tube. Into test-tube No. 1 drop a measured quantity of rennet ; to the milk in test-tube No. 2 add the rennet and also sodium citrate in the proportion of 2 gr. to the ounce of milk ; and into test-tube No. 3, in addition to the rennet, add sodium citrate in the proportion of 5 gr. to the ounce of milk. Incubate until coagulation is completed and examine all the tubes. No. 1 will contain a dense, tough, shreddy curd ; No. 2 will contain a soft flocculent curd, easily pulping under the finger, and closely resembling that of human milk ; No. 3 will contain little or no curd at all. Sir Almroth Wright, therefore, suggested that cow's milk to which sodium citrate in the proportion of 2 gr. to the ounce has been added might afford a valuable means of feeding infants.

To Dr. F. J. Poynton the profession is indebted for putting this proposal to a practical test. His results, published in the *Lancet* in 1904, were so encouraging that citrated milk has now become widely employed and recognized as a useful method of infant feeding. This observer, however, did not adhere closely to the original suggestion, but combined citration with dilution, using 1 gr. of sodium citrate, and not 2 gr., to the ounce of milk.

The advantages of an undiluted milk appeared to me to be so great that I determined to give whole citrated milk a thorough trial, and now, after more than five years' observation of a large number of infants who have been fed in this way, I believe it to be the best form of artificial feeding in all but exceptional cases.

The technique is simplicity itself. Sodium citrate

is readily soluble in water, and solutions can be prepared of the strength required. The plan which I adopt is to order a solution of 10 gr. to the drachm. A drachm of this solution is added to each quarter of a pint of milk, thus giving the 2 gr. to the ounce of milk which is required. It may be added to the milk when it is first delivered in the morning, or to each feed as it is prepared. I always bring the milk just to the boil, or in other words "scald" it, not only because this renders it much safer from the point of view of infection, but also because the citrated milk curd is softer as the result. Occasionally a pellicle of mould may grow on the surface of the solution if it is kept in a warm place, but this may be obviated by the addition of a few drops of chloroform water. Sodium citrate is also sold in tablet form, one or more of the tablets being crushed and added to the milk, but I have found that the solution is the more reliable preparation. Citrated whole milk may be begun when the baby is 2 weeks old.

With regard to quantities, clearly the amount will be less than if the milk is given diluted. No hard-and-fast line can be drawn as to the frequency or size of the feeds, since so much depends on the vigour and strength of each particular child, and the proportion of its weight to its size, and I do not propose to give a table of amounts, being convinced, not only of their inutility, but also of their possible danger. Roughly speaking, for the second fortnight of life about $\frac{3}{4}$ oz. is sufficient; for first to second month, $1\frac{1}{2}$ oz.; for second to third month, $2\frac{1}{2}$ oz.; for third to fourth month, $3\frac{1}{2}$ oz.; fourth to fifth month, $4\frac{1}{2}$ to 5 oz. These figures must only be taken as roughly approximate. Some infants will take more with benefit, others need to be treated as though of a younger age. The surest guides are the baby's appetite, the weight chart, the state of the motions, and the general progress.

I have little experience of citrated milk during the first two weeks of life, and although cognizant of several instances where citrated undiluted milk has proved satisfactory even at this early age, I should not be disposed to use it. In the breast, as Dr. Eric Pritchard has pointed out, "the transition from colostrum to coagulable milk is relatively slow, it may be ten days or more before the mammary secretion assumes the characters of true milk. During this time the stomach has been functionally developing, acquiring tolerance to the presence of coagulated casein and learning to peptonize and liquefy the clot soon after its formation. There can be no evasion or short-circuiting of the work." I am informed by Dr. Dicks, who has had charge of infants in a London infirmary, that whilst several infants flourish on citrated milk almost from birth, others fail to do so. The material, however, with which he had to deal was of the poorest kind. Having in view the nature of the breast secretion at this period, the safest plan is to give whey, gradually strengthened by citrated milk during the first fortnight or three weeks, rather than risk promoting early indigestion. The objections to citrated whole milk at this period apply, of course, with greater weight to milk which has been diluted merely.

ADVANTAGES.

Whole milk, if it can be given in a digestible form, has many obvious advantages. One of these is the small volume of the feed, as compared with that of diluted milk; for there is no doubt that there are many cases of indigestion induced, not by the faulty composition of the meal, but by its excessive bulk. We cannot dilute the milk without at the same time diluting the gastric juice; moreover, by distending the stomach we place its musculature at a disadvantage, and, by producing defective motility, militate against efficient mixing of its contents, and so hamper

digestion. Again, if the milk is diluted it becomes necessary to add cream to bring the fat content up to that of human milk. This forms a serious objection to diluted milk, for cream is expensive, very variable in its constitution, often very rich in micro-organisms, and for the summer months almost always contains some form of preservative. *Any* form of cream is beyond the means of the majority of hospital patients, while sterilized cream, the only safe kind in the summer, is still less readily procurable. Another advantage of whole milk feeding is its simplicity. The different degrees of dilution at different ages, and consequently the varying amounts of cream to be added, make feeding with diluted milk a difficult process for the average mother. This is avoided if whole milk is used. Little manipulation is required, a matter of considerable importance from the point of view of contamination, especially in the houses of the poor. A matter of less moment is an absence of that constant soaking of the napkins which occurs when diluted milk is used.

LIMITATIONS AND DISADVANTAGES.

It is not claimed for whole citrated milk that it is a panacea for all the digestive disturbances to which infants are prone. There are certain very exceptional children who, from earliest infancy, cannot take milk in any form. In them milk seems to act as a poison, producing symptoms of serious toxæmia. There are others—a small proportion, I believe—who suffer from fat indigestion. For them citrated whole milk is contra-indicated, for what they need is reduction of the fat content. The discovery that the curds passed by the bowel consist largely of fats and soaps is not necessarily an evidence that fat-indigestion is the important factor to be treated, for if the protein coagulum be tough and firm the fat globules are entangled in its meshes, much like blood corpuscles in a thrombus, and in this way the fat-splitting ferments are placed at a

disadvantage. Render the curd soft and flocculent, and the fatty pellets may disappear from the motions. Milk in any form is unsuitable for the epidemic diarrhœa of the summer months. There are also a certain few babies who may truly be said to be born to die; without presenting any gross lesions, they resist all methods of feeding and gradually sink from inanition. These subjects of "abiotrophy" are often born at the end of long families or when the mother is getting on in years, and are not endowed with sufficient vital force to live. Failures in feeding by this method, as by any other, are sure to be met with, too, if organic disease, such as congenital syphilis or stenosis of the pylorus, is present.

One of the disadvantages which are said to attend undiluted citrated milk is that it engenders constipation. I have not been able to convince myself that this is the case, although it is true that the motions are more bulky; nearly all the babies whom I have watched who have suffered from constipation were similarly affected before the citrated milk was begun. Urticaria and erythematous rashes have been produced when sodium citrate has been given in excess, but never, in my experience, in the proportion here recommended. A rational objection to whole milk is that more protein is given than is present in human milk, and, therefore, more than the infant needs. One can only say that it does no harm when the curd difficulty is overcome by citration. The size of the motion indicates that some of this is passed, but I have no data as to the ratio between the amount of protein utilized and that excreted, and how this compares with the same ratio when diluted milk is given.

RESULTS.

The progress in weight and strength of the infants fed by this method fully justifies the claims which have been made for it. I have now watched some hundreds of

infants reared on citrated whole milk, and am convinced of its value. The failures are surprisingly few, and very rarely has another method been substituted with advantage. On the other hand, time and again I have replaced other methods by it, with success. Rickets, gastric dilatation, general hypotonia, and that puffy and pasty appearance so commonly seen in babies fed on diluted milk, do not develop; on the contrary, the muscles are particularly strong and firm.

Another occasion for citrated milk is at the time of weaning. It may be substituted gradually for the breast, first using 2 gr. to the ounce of milk, and then 1 gr. The sodium citrate may afterwards be omitted. Such a gradual transition from breast milk to cow's milk safeguards the baby from the dangers to which a sudden change subjects it. Its efficiency in the feeding of marasmic children I have recorded elsewhere (*Proc. Roy. Soc. Med.* (Child. Sect.), vol. iii.)

MILK IN THE POOR HOME.

BY DR. G. R. PISEK.

New York City.

THE present paper will deal with the milk problem particularly as it relates to large centres of population drawing their milk supply from sources distant many miles (in some cases 450 miles and eighteen hours), necessitating that from twenty-four to thirty-six hours elapse between milking and delivery to the consumer.

In carrying out the policy of bettering the milk supply, the New York Milk Committee became a demonstrating as well as an investigating body. Five cardinal lines of activity stand out in the Committee's campaign for pure milk and its closely related object, the reduction of infant mortality:—

First, education of mothers in the care and feeding of their babies demonstrated to be practical through infant centres known as milk stations.

Second, clean milk at a low cost to the poor—a necessity — made possible by the Committee's experiment in clean milk production along lines laid down by Dr. Charles E. North, Chairman of the Committee's Sub-committee on Public Health and Sanitation. The type of milk thus produced is now used by the municipal milk stations.

Third, the elaboration of a set of milk standards as to cleanliness and safety, these being essential for the guidance of producers, dealers, consumers, and officials.

Fourth, effective organic co-operation of all public and private infant welfare agencies with the milk station work, thus making the milk station a centre of infant welfare activity and promoting efficiency in giving the best results without waste of effort.

Fifth, a campaign of pre-natal supervision conducted in connection with the milk stations, in which the effort is directed to reduce the waste of infant lives by preventing stillbirths and reducing the mortality during the first month of life by preventing premature births, securing stronger and healthier babies and making maternal nursing possible.

In 1908 we were serving modified milk to poor mothers who could not nurse their babies. In an endeavour to ascertain which form of the milk was best adapted to the purpose, four stations used raw milk and three used the same milk pasteurized. The results justified the belief that when the milk supply is carefully guarded, raw milk is best, but in supplying a large city with milk, the difficulty of so guarding the milk is so great at the present time, that it has been decided that pasteurizing is advisable till the general quality of the milk has been raised to a better average standard.

It must not be forgotten that these mothers were not only receiving ice for the preservation of the milk, but careful instruction in the care of the baby milk supply. We meanwhile found that the cost of modifying milk in individual packages was becoming prohibitive (a quart of milk costing the committee, including all administration charges, 28 cents when placed in the hands of the mother). We accepted the lesson, and determined to sell at cost to the mothers a quart or pint bottle of milk and teach them how to modify it in their own homes. For a whole year milk was thus dispensed, the mother being taught by the station nurse, first, at the station, as to the general principles of modification (class-room work and demonstration); second, by demonstration in her own home; third, by supervision in her own home when it was believed she was sufficiently capable to do the modifying herself. Only in rare instances did it develop that a mother was so ignorant or careless that it was necessary constantly to modify the milk for her baby at the stations. This method I want particularly to bring to your notice as best fulfilling the fundamental principle involving all work tending to the reduction of infant mortality—namely, instruction. I can conceive of localities and circumstances in which it would be better previously to modify the milk for each individual. This method may still be the better for milk dispensaries in connection with babies' hospitals to which will be gathered babies convalescent from alimentary disturbances, but for the general prophylactic work of milk depots we must strongly urge the adoption of the home modification method. That this opinion is gaining ground in America is indicated by the fact that a majority of the cities have changed to this method. Over 80 per cent. of the work in New York City is now done in this way.

In the order of the efficiency in the reduction of

infant mortality, milk stations may be grouped into three classes:—

First, those giving instruction in the principles and methods of home modification, including the care of milk by the consumer.

Second, those dispensing modified milk plus instruction in hygiene, &c.

Third, those supplying modified milk without instruction.

That this first method is effective in saving baby lives may be demonstrated by the results of our campaign in New York City in 1911. In station districts that year the death-rate among the babies enrolled at the stations was only half that in districts at large. The general rate in one tenement district was reduced from 148·5 in 1910, when there was no station, to 99·1 in 1911 under station supervision.

This campaign conducted by the Milk Committee was so successful that the City of New York was induced to appropriate sufficient money to carry on the York under the division of child hygiene. That it is being most creditably carried on I am pleased to testify.

In order to make the milk station a success among the very poor of the tenement districts, it was necessary to secure milk of first quality at a price within the reach of these people which at the same time would not tend to pauperize them by making them the recipients of partial charity. It was further desirable that some method be found whereby these mothers, educated to buy first quality milk for their babies at the milk stations, should be able to procure an equally safe milk from the commercial companies at the same price, in order that they may not be at the mercy of dealers in poor quality milk when they have not easy access to a milk station. Believing it possible to produce first grade milk at a moderate price, Dr. North induced a couple of philanthropic capitalists to

STATISTICS FOR STATION AREAS, DEDUCTING STATION ENROLMENT FROM DISTRICT BIRTHS AND STATION DEATHS FROM DISTRICT DEATHS, COMPARED WITH STATION FIGURES.

			STATION DISTRICTS			STATIONS		
			Deaths	Births	Rate	Deaths	Enrolment	Rate
1. E.	...	...	42	987	42.5	12	256	46.8
2. E.	...	...	11	457	24.0	0	123	0.0
3. E.	...	...	32	1,067	29.9	2	207	9.6
4. E. and 21 E.	...	...	46	1,347	34.1	6	430	13.9
5. E.	...	...	30	857	35.0	0	155	0.0
6. E.	...	...	39	1,046	27.2	1	153	6.5
7. E.	...	...	22	678	32.4	7	142	49.3
8. E.	...	...	33	753	43.8	3	158	18.9
9. E.	...	...	29	374	77.5	5	187	26.7
10. E.	...	...	44	581	75.7	6	205	29.2
11. E.	...	...	69	1,364	50.5	14	299	46.8
12. E.	...	...	65	1,273	51.0	5	283	17.6
13. E.	...	...	13	255	50.9	1	111	9.0
14. E.	...	...	27	377	71.6	4	176	22.7
15. E.	...	...	30	435	68.9	9	170	52.9
16. E.	...	...	18	336	53.5	5	135	37.0
17. E.	...	...	15	262	57.2	6	135	44.4
18. E.	...	...	34	516	65.8	6	267	22.4
19. E.	...	...	76	1,433	53.0	8	198	40.4
20. E.	...	...	8	204	39.2	2	134	14.9
22. E.	...	...	12	265	45.2	2	101	19.8
23. E.	...	...	25	587	42.5	0	189	0.0
Total east side			720	15,454	46.5	104	4,214	24.6
1. W.	...	...	43	625	68.8	4	236	16.9
2. W.	...	...	22	426	51.6	10	129	77.5
3. W.	...	...	38	407	93.3	8	117	68.3
4. W.	...	...	94	1,211	77.6	7	198	35.3
5. W.	...	...	23	287	80.1	2	91	21.9
6. W.	...	...	19	121	157.0	5	121	41.3
7. W.	...	...	42	342	122.8	2	139	14.3
8. W.	...	...	16	231	69.2	3	134	22.3
Total west side			297	3,650	81.3	41	1,165	35.1

SUMMARY.

East side	...	720	...	15,454	...	46.5	...	104	...	4,214	...	24.6
West side	...	297	...	3,650	...	81.3	...	41	...	1,165	...	35.1
Total	...	1,017	...	19,104	...	53.2	...	145	...	5,379	...	26.9

purchase a dairy at Homer, New York, near Syracuse. This was fitted out as a central plant where milk could be scientifically pasteurized and bottled, and the utensils used by the farmers sterilized. A group of farmers with ordinary farm equipment were induced by premiums to sell their milk to this creamery and adopt the methods prescribed by the company; instead of compelling the farmer to build an expensive plant such as is ordinarily used for producing certified milk, he was simply asked to keep his stables and cows and milkers reasonably clean and use a special milk-pail provided with a small opening at the side of the top, the top being covered so that no dust would fall in the milk. When the milking was done the pail was capped and sent direct to the creamery, where it was emptied, then cleaned and thoroughly sterilized at the central plant. After this it was sealed with the cap and sent back to the farm, not to be opened until the next milking time. By this process, with no additional expense to the farmer, it was possible to produce milk equal to the 15 cent and 20 cent certified milk at 8 and 9 cents per quart. This company now has a contract for providing the municipal milk stations.

Another question that arises in this connection is what type of milk to advise for use in the poor home—the milk which will be produced preferably for drinking purposes for the mother and the children? It should be that milk which is cheapest and shall have the qualities of a life-giving and not a life-destroying fluid. It should come from healthy tuberculin tested cattle, and contain not more than 100,000 bacteria with a fat content not less than 3.5 per cent. If this milk is then pasteurized according to modern methods at the receiving plant located near the dairies, it will have qualifications that make it eminently suitable for use in the poor home, *i.e.*, it will be less liable to atmospheric changes; to deterioration from

carelessness or neglect on the part of the consumer; it will contain no virulent organisms that can produce disease in children of this kind who are so likely to have a lowered body resistance, and epidemics of streptococcus sore throat will be impossible. If we decide to use or advise such a supply, we shall have an important duty to perform, namely, popular instruction relating to milk in the home and its economic value; comparison of milk with other household foods; the refrigeration of the milk, especially in cases where the cost of ice is almost prohibitive.

The mother must be taught how to preserve the milk during the hot summer days by constructing cheap home-made ice-chests. She must know that milk is very susceptible to contamination, absorbs odour readily if not rightly preserved.

In order to determine what the standards of pure milk should be the National Commission on Milk Standards was appointed by the New York Milk Committee in March, 1911, as a result of a Milk Conference held under the auspices of the Committee in December, 1910. This Commission consisted of seventeen experts from all over the country. After a year of careful work it recommended grading milk into four classes:

Grade "A"—Certified milk or its equivalent.

Grade "B"—Inspected milk.

Grade "C"—Pasteurized milk.

Grade "D"—Milk not suitable for drinking purposes.

It recommended that milk suitable for infant use should not contain more than 100,000 bacteria per cubic centimetre when used raw, or if pasteurized not more than 10,000 bacteria per cubic centimetre when ready for consumption. It condemned the use of "loose" or "dipped" milk except under carefully guarded conditions. As the result of these findings the New York City Board of Health adopted these

grades with slight modifications and passed an ordinance forbidding the sale of the lowest grade in any eating place in the city. It is now considering an ordinance forbidding the sale of "loose" or "dipped" milk in any but certain dairy stores properly certified by the department.

The deaths under one year in New York City have dropped in two years from 125·6 to 105·3 per 1,000. That this is the result of a city-wide campaign directed principally against summer diarrhœa cannot be gainsaid. If we are to make a further reduction other lines of work must be mapped out, such as pre-natal instruction in an effort to reduce the number of deaths from so-called congenital debility. If we are to reduce the mortality and morbidity, then no detail which pertains to the care of milk in the home must be neglected. Such efforts can be best derived from milk stations, infant welfare centres, public lectures, and last but not least, newspaper publicity.

THIRD SESSION, AUGUST 5.

The third session of the Section was held on Tuesday morning, under the chairmanship of Dr. C. A. Hodgetts (Medical Adviser to the Commission of Conservation of Canada).

In the absence of Dr. BALLANTYNE his paper was read by Dr. SALEEBY.

ANTE-NATAL HYGIENE.

By J. W. BALLANTYNE, M.D., F.R.C.P.E., F.R.S EDIN.

Physician to the Royal Maternity Hospital, Edinburgh; formerly Lecturer on Ante-natal Pathology and Teratology in the University of Edinburgh and in the Medical Graduates' College and Polyclinic, London.

ANTE-NATAL hygiene may be said to have to do with all that makes for and tends to preserve the health of the infant before birth, with everything which prevents or resists the poisoning of the springs of life. It is, therefore, the great subject of prevention of

disease and deformity before birth ; it is also the little-developed, little-thought-on matter of ante-natal treatment.

Ante-natal Hygiene and Infantile Mortality.

At the National Conference on Infantile Mortality which met here in 1906 I had the opportunity of dealing with the ante-natal causes of that mortality, and I shall not now endeavour to go over again the ground then covered, but shall content myself with the passing allusion to it which I have just made.

Ante-natal Life.

Ante-natal life occupies the period of nine months or so before birth. During seven of these months (from the third to the ninth inclusive) the unborn infant is growing rapidly in size and weight, is finding its nourishment in the mother through the important connecting organ called the placenta or afterbirth, is being prepared in every sense for the calls which are to be made on it immediately after birth, and is being fitted, in a word, for its post-natal existence of possibly seventy years ; at the same time the infant has already in itself the power and the qualities of a life which is distinct from its mother's, for it is in no way a simple replica of its mother, nor is it a miniature of its father, nor, for that matter, is it even a blend of them both, being rather a composite photograph, so to say, of many ancestors with the possibilities of being made better or sadly marred in the developing or printing (to use the language of photography without, of course, accepting the literal meaning thereof).

But there are two earlier months, the first and second of the nine, which come within the scope of the ante-natal life of the infant. These constitute the embryonic time, and follow immediately upon conception ; during these weeks the new being is fashioned

from the comparative simplicity of the ovum or egg into the great complexity of the human embryo, clearly recognizable at the end of the second month as a babe in miniature. The general character of the life of these two months is development, with its kaleidoscopic or cinematographic changes; and it differs greatly from that of the seven months, which is mainly one of growth along lines already well defined.

The Mechanism of Ante-natal Life.

These two periods agree in this, however, that they are both conditioned by the life and health of the mother; their environment, so to say, is maternal. Even before the mother is conscious that she has conceived, certainly before she is sure that she is carrying a child in her womb, the close dependence of the new life upon the older one has begun. Not only that, but the mother's organs and tissues have begun to react to the stimulus of the tiny mass of intensely vital formative stuff which lies within. Physiology has only begun to realize how wonderful and how well worthy of the closest scrutiny is the inter-action between the infantile and the maternal organisms in these weeks and months of ante-natal existence; there is no older problem and no more fascinating modern theme than to discover how the bones grow in the womb, and to investigate the whole of Nature's mechanism whereby she makes it possible for the mother to nourish and direct the growth and development of her unborn infant, and for the latter to so stimulate and encourage, so to speak, the mother's tissues and organs to increased effort and even to novel endeavour in order to meet the new demands made upon them.

Ante-natal Hygiene and Eugenics.

Even heredity and the study of the laws which govern the handing on of what we call good or bad

traits and structural peculiarities from one generation to another contain no matters for thought and research more immediately important or more practically useful than do ante-natal hygiene and the nine momentous months which precede birth. I am glad when I hear of men and women, gifted with all the qualities which make research into life-problems both valuable to others and ennobling to themselves, throwing themselves with abandonment into the study of eugenics ; but I often wish they would for a while suspend their efforts to reach the far-off eugenic goal and concentrate them on the hygiene of the nine months of pregnancy. I know well that it is said and believed that by the time an infant has reached the womb of its mother, its fate, eugenic or dysgenic, is fixed and irrevocable ; but I know also that even the most hereditary of maladies may be ameliorated after birth, and there is reason in supposing that they may be much more ameliorated during the nine months before birth when the new organism is so plastic and alterable. But even if it be proved—it has not yet been proved—that the conditions of life in the nine months before birth have no influence either for good or ill upon hereditary maladies and deformities (using the word heredity in its strict sense, and not in the loose one of “any thing which a child is born with”), even then there remains much to be done in ante-natal hygiene, for there cannot be the slightest doubt that many morbid influences come to play upon the body of the infant in the womb and that some at least of them may be prevented or their results cured.

The Destruction of Ante-natal Health by Syphilis.

Take that subject about which at the present time there is the most pressing need for frank speaking and full recognition ; I mean venereal disease, as it is called, although it is better to concentrate one's thoughts specially on syphilis. It is painful to have to

speak of it ; it is revolting to have to study its effects ; it is heart-rending to watch, as we doctors have to do, its maleficent and accursed mark being imprinted on the bodies of the mother and her child ; but it is time, it is long past time, to tear away the veil which prudery and what is wrongly called common decency has thrown over this subject, and to show it in all its loathsome nakedness and horrible reality. We are terrified when we brush up against a man who has come from a smallpox patient's bedside ; we shudder at the risks we run from the dried up sputum of the victims of consumption which may be floating in the air we breathe ; a thrill of horror runs over the whole land when there is news that a case of plague has reached Liverpool or that a man has died of cholera in London : but if we only realized it the results are far more deadly when a husband infects his wife with syphilis and the misery entailed is infinitely greater. To my mind the most pathetic words in medicine are *syphilis insontium* (syphilis of the *innocent*), just as the most hideous book on medicine is the so-called atlas of venereal diseases. Syphilis is sometimes spoken of as a hereditary malady ; it is an insult to the name heredity to call it so. It is a contagious disease, which, when it affects a woman about to become a mother, has the most certainly maleficent effect upon the fruit of the womb. It is a commonplace of the text-books of medicine and midwifery that when a man infects his wife with this disease there may follow seven or eight abortions (each one of which is, of course, an ante-natal death), two or three dead-births, and finally the birth of a few infants with the disease in so attenuated a form (the virus having, so to say, tired itself out) that they may continue to live for some years a damaged existence in the world. No wonder Fournier has been stung into using the expression "horrible mortuary tables" to describe the statistics of ante-natal syphilis. One cannot use the

words ante-natal hygiene when one or other or both parents are suffering from syphilis ; there can be no such thing as hygiene then.

But if syphilis be the most potent of all the causes of ante-natal death and disease, it is in connection with it also that there comes the most hopeful outlook for treatment, preventive and curative. The cause of it, the *Spirochæta pallida*, is among the most easily recognized of microbes, and there is a blood test of the presence of the disease which is reliable (the Wassermann reaction) ; so the malady can be easily diagnosed both after death and during life. Then, again, there are medicines (such as mercury and arsenic) which are effective in cutting short the malady's dire course ; and these when given to the expectant mother avail for the infected child in her womb ; there is no kind of ante-natal treatment more hopeful than that of syphilis of the unborn infant. But these are not the only things which should be and which may be done. With the triumphs of preventive medicine all around us, with typhus practically unknown now, with typhoid fever checked, with the sting taken out of diphtheria, with smallpox so rare as to be almost unseen by the present generation of medical practitioners, with Malta fever banished with the infected goats which harboured its cause, with tuberculosis giving way before the regimen of the open window—with all these beneficent advances made or in the making, it is surely not beyond the wit of man to devise means for the prevention of syphilis. The greatest possible forward movement at the present time in ante-natal hygiene is the detection of syphilis and the prevention of its spread. It is even more important than the control of alcoholism. So enormous are the advantages which will accrue from its eradication that it is not too much to hope for the time when every parent will demand from a prospective son-in-law a pre-nuptial certificate of good

health in which will be contained, even if it be not named in so many words, the assurance that the bearer is free from syphilis. If a man truly loves a woman and has regard for his sons and daughters yet unborn, he will not grudge the slight indignity of being asked to show proof of his own health ; nay, he will not regard it as an indignity, but will voluntarily make it a matter of duty and an expression of affection. A more difficult task will be the eradication of syphilis acquired after marriage, for one must sorrowfully admit that this disease sometimes enters the family circle from without through the unfaithfulness of husband or wife. It will be well if the law would take cognizance of such post-matrimonial infections in dealing with actions for divorce, making the unfaithful partner in the union in some way or other to suffer for the injury inflicted upon the faithful spouse whom he (or she) has infected.

Advances in Ante-natal Hygiene.

Now, let me indicate, necessarily in the fewest words, some of the ways in which ante-natal hygiene may be fostered and the health of the unborn infant secured.

In the first place it is essential that authoritative facts regarding the amount of ante-natal disease and death be forthcoming ; we must get to know the strength of the foe with whom we are fighting. This means the introduction of compulsory registration of stillbirths, and, if means can be devised, of abortions as well. It has been calculated that there occur about 19,000 stillbirths every year in England and Wales ; but this is only an estimate, and the reality may be very much worse. At any rate, it is necessary to know, and for this purpose a means of registration or notification must be devised. The medical profession, as represented perhaps by a committee of experts in obstetrics and legal medicine, should be freely

consulted before a Stillbirths Registration Bill is framed and introduced into Parliament ; and, if I may say so, the medical practitioner should not be treated as he was and is under the Notification of Births Act—made responsible and fined for neglect in performing a public service, but not rewarded even to the extent of a shilling for doing what is asked of him. I am prepared to suggest the main principles and lines of such an Act.

In the second place inquiries should be made into local conditions, and especially into the sale of abortifacient drugs, where the stillbirth-rate is found to be high ; and some sort of check should be put upon the present facilities for the obtaining of medicines and nostrums for the procuring of miscarriages.

In the third place the medical profession, as a whole, should take a much more active part in the supervision of pregnancies. The medical practitioner should endeavour to get into touch with the expectant mothers in his or her practice to a much greater extent and at a much earlier date in gestation than is done now. He should be ready to give advice regarding the early but often very troublesome disabilities and discomforts of pregnancy, and he should try to relieve all suffering so arising to the best of his ability. If he do this, patients will not be long in finding him out and in coming to him for help.

In the fourth place there should be supervision of the pregnancies of the poor as well as of the middle and upper classes. All maternity hospitals should be furnished with pre-maternity or pregnancy wards for the reception of patients, married or unmarried, who are suffering from one or other of the diseases of the pregnant state. Nearly fourteen years' experience of such a ward in the Edinburgh Royal Maternity Hospital has convinced me of its great value, for I have seen patients, for whom no accommodation was provided elsewhere, come into

that ward and get relief from suffering and the cure of their illness. I could tell of women there treated in whom in four or five previous pregnancies there had been premature births of dead infants to be chronicled, and in whom there was now the record of the birth of a healthy living infant at the full time.

In the fifth place, whilst fully acknowledging the great good which has come from the maternity benefit under the National Insurance Act (and the good will become more apparent and the inconveniences less marked as time goes on), I would point out that help, financial or otherwise, is often as sorely needed before as after the birth of the child. Indeed, rest before labour is, in my opinion, sometimes more essential than it is after it; and it has been proved that from the standpoint of ante-natal development and growth the release of the mother from the necessity of working for her daily bread just before her confinement greatly aids the unborn infant as well as the mother herself. It is a matter worthy of consideration whether, under the Insurance Act and utilizing the machinery of that measure, it would not be possible to lead expectant mothers to give notice of their pregnancies at early dates. This would give us a sort of voluntary registration of pregnancies, and consequently an indication of the number of them that come to nothing. Perhaps women would be led to do this if a more substantial maternity benefit were given to those mothers who made the announcement; with the establishment of large pregnancy departments in existing maternity hospitals it would be possible also to give to these women rest and treatment before their confinements.

Finally, there are other ways in which the state of ante-natal health may be better cared for. There is, for instance, what may be called the hygiene of the honeymoon, including the realization of the possibility that the close of this period, when, according to

Dr. Johnson, "there is nothing but tenderness and pleasure," may coincide with the commencement of ante-natal life. Ignorance is accountable for many of the reproductive disasters which immediately follow marriage, and project their baneful effects far on into later life—ignorance, and its ally, excess. There are also advances to be made in the sphere of medicine and midwifery; the lives of many unborn infants may yet be saved by the discovery of better methods of treating the many diseases of pregnancy, which, while carrying danger to the woman herself, also bring risks to the new being in her womb. There is, for instance, the vaccination of expectant mothers during a smallpox epidemic, not only for their own sakes, but for the protection of their unborn infants. These, however, are purely medical or obstetrical questions, and I need not dwell on them here, beyond stating that they are of great importance, and that they cannot be properly faced without pre-maternity wards.

DISCUSSION.

Dr. SALEEBY (London) said that it was his privilege to be resident to the maternity ward at Edinburgh when the pre-maternity ward was started—they began with a single bed and increased—and there was no question but that the results had been simply glorious. He thought that Dr. Ballantyne's remarks on syphilis ought to be registered in some way by the Congress. It was simply extraordinary the way in which the public mind would persist in ignoring it. A simple illustration of this attitude had just occurred to him. He had a wire asking him to write an article on the International Medical Congress, and he devoted half or more of that article to the question of syphilis, as he wanted to back up the proposal for a Royal Commission, and the whole of the article dealing with this was cut out. The other day Sir Thomas Barlow wrote demanding that there should be a Royal Commission on the subject, and yet the Press would not have it mentioned in their columns. That was the kind of thing they had to fight against, and they ought certainly to send a resolution to the Press dealing

with the matter. The other point he wished to bring forward was that of alcohol. He did not think that had been adequately recognized in the programme of the Congress, and he considered it was worth while to point out that they were getting very important actual evidence, and not supposition, that alcohol was one of the poisons that affected the child before birth. Dr. Ballantyne just mentioned it, but Dr. Kerr did not refer to it. There were many poisons which might be inserted into the mother and through her into the child, as had been proved beyond doubt, and alcohol was a conspicuous illustration. He had two papers with him about which little was known in this country. One was by Dr. Edward Bertholet, who devoted nearly five years to a microscopic study of the effect of alcoholism upon the reproductive organs, and he had page after page and illustration after illustration showing how alcohol caused unmistakable degeneration of the ovaries in exactly the same way as it caused degeneration of the liver and kidney cells. This was evidence based on five years' scrupulous first-hand work, and reported at intervals in leading Continental journals, showing that the reproductive organs were more susceptible to the influence of alcohol than any other organs in the body, for the reason they might suppose that they contained what were really the youngest cells—the most active, and therefore the most susceptible. He had also a paper by Professor R. Stockard, of New York, who devoted two or three years' observation to the influence of alcohol upon the health of offspring in the case of guinea-pigs. In that paper were to be found the photographs of guinea-pigs whose fathers or mothers, or both, had been treated with alcohol. Directly any sign of approaching intoxication was observed the alcohol was abolished. They did nothing but inhale it for a short period every day regularly, and the result on the offspring was unquestionable. He believed that in the light of evidence like that students of infant mortality had to pay more attention than they had yet paid to the influence of alcohol, partly through the father and very notably through the mother, because they had very definite evidence that a very short time after the administration of a dose of alcohol they found it in the blood of the *fœtus* also.

Dr. HELEN MACMURCHY (Toronto) said that before they passed from the point perhaps they ought to remind themselves of the German results, where two and in some cases three generations of alcoholics were regarded from the point of view of whether or not the female descendants were able to nurse their offspring. The results were very

striking. The daughters of alcoholics were not able to nurse their offspring except in a very small percentage of cases.

The CHAIRMAN said they had to remember that they were dealing with syphilis. It was a most delicate subject, and one the medical profession was disinclined to discuss, but to-day it was one of the most important questions, and they must face the issue and discuss the matter, and he hoped something would result from such discussion. He noticed in reading through the different papers presented to the different sections that there was a great divergence of opinion in regard to the registration of stillbirths. He saw that the authors of some of the papers said they should not be registered, whilst Dr. Ballantyne said they should be registered. Personally, he thought they should all be registered. It was, in his opinion, the only way of getting at many of the difficult problems of criminal negligence on the part of parents, and he thought there should be some positive pronouncement on the part of this Conference with regard to the matter.

Dr. MARY BOOTH (Commonwealth of Australia) said that in regard to the last question which had been raised, it must be remembered that registration of stillbirths would enable them to determine accurately the ratio of sex. It was the commonly held opinion that more male children were born but that more girls survived. She would like to know if there was not the possibility of some fallacy in regard to this view. Registration would throw a very important light on vital statistics, for it was quite possible that they had been arguing on wrong premises in the past because they had not had the registration of the sexes of stillborn children.

Miss MAYNARD asked to say a word with regard to the registration of stillbirths. In her experience as an Inspector of Midwives she considered it was shown to be absolutely necessary, for the very simple reason that all the so-called stillbirths were not stillbirths. Personally, she was instrumental in causing the exhumation of the bodies of two or three children who were buried as stillbirths, and it was found that they had lived for some hours. In many cases also she was instrumental in obtaining *post-mortem* examinations of children who were about to be buried as stillbirths, in which it was proved that they had made vigorous efforts at respiration. They had simply been murdered. She thought the experience of most inspectors and workers would bear her out that many of the children buried as stillbirths were not so born.

A CAMPAIGN OF PRE-NATAL HYGIENE IN NEW YORK.

By PHILIP VAN INGEN, M.D.

New York City.

WHEREVER consistent, determined effort is being made, the infantile mortality rate is falling—slowly, to be sure, but nevertheless falling. But when we study the details of the mortality returns certain facts are brought out very sharply. In New York City the rate for the three years, 1905 to 1907, was 152·3; for 1908 to 1910, 127·8. In 1911 it was 111·6, and in 1912, 105·3. While there has been a marked reduction in the deaths of babies, this has practically all occurred at ages over one month.

			Under 1 month		1 month, and under 1 year
1908 to 1910	...	...	43·3	...	93·2
1911	...	...	40·4	...	82·0
1912	...	...	41·1	...	75·3

The decrease has been marked at the more advanced age, while it has been very slight at ages under one month. About 40 per cent. of deaths in babies are set down in mortality tables to that group of conditions known as "wasting diseases," among which we find such vague terms as "congenital debility," "inanition," "malnutrition," "lack of breast milk," &c. These deaths occur mostly during the first month of life, and are sometimes called the "unavoidable" infant mortality. It is generally admitted, I think, that these conditions are largely the result of processes acting upon the child before its birth, through the mother. If this is so, the prevention of this 40 per cent. of the infantile mortality must be accomplished by methods directed toward the mother before the child is born. We must try to secure a healthier child by having a healthier mother, and one who is better able to nurse her baby.

In a paper read before the Royal Statistical Society, in 1912, Dr. Dudfield said: "I cannot help thinking that we are approaching the lowest limit of the rate of mortality which can be expected to be attained by the present methods of prevention. Such methods are, for the most part, concerned with post-natal causes of mortality. Ante-natal causes, except so far as ordinary sanitary activities may affect them, have not been taken up at all."

The purpose of this paper is to present a brief statement of the campaign carried on by the New York Milk Committee during the last twenty-two months, its object being the reduction of the so-called "unavoidable" infantile mortality, due to ante-natal conditions. The work has been carried on in certain districts in the Borough of Manhattan, where investigation showed the births and infant deaths to be most numerous. The Borough of Manhattan is the old city of New York. It is the most congested of the five boroughs comprising the greater city. Some of the wards, with an area of from 100 to 200 acres, have a density of population of from 500 to 700 per acre. Certain city blocks run as high as 1,500 to 1,600 to the acre. In the entire borough, which contains the wealthiest as well as the poorest districts, an average of over thirty people are housed in each dwelling. Over 47 per cent. of the population are foreign born, and an additional 35 per cent. are of mixed foreign and native parentage. Of the births reported during the years 1910 to 1912, 67.7 per cent. were to foreign born parents, and in another 9.8 per cent. the mother was of foreign birth. Not only is the proportion of children of foreign born parents very high, but in 54.4 per cent. of all births the parents came from Russia, Poland, Italy, and Austria-Hungary--the most difficult class of people to deal with on account of ignorance and their tendency to segregate and live according to the customs

of the home country. One can walk for many blocks in certain sections of the city and not see one word of English displayed in the windows, or hear one spoken, except by the children of school age. Over one-half of the confinements among the poorer parts of the city are attended by midwives. Our situation in regard to the midwife is not so fortunate as that here in England. Supervision is poor, owing to the enormous amount of work which the Division of Child Hygiene of the Health Department has been obliged to assume without sufficient funds for carrying it on. Instruction has only just been begun, and that in the face of strong, and, I think, misguided opposition.

Such are the conditions under which we have worked, and we have chosen the districts where they are at their very worst, our object being to see what can be accomplished under existing conditions. The conditions are in urgent need of correction, but years must elapse before that can be accomplished, if it ever can, and meanwhile the babies are dying.

The work is carried on by eight trained nurses, under the supervision of a directing nurse and a field physician. Two volunteer medical directors have general direction of the work, and a medical council stands ready to advise as to methods and special matters which come up. The nurses were chosen with the greatest care, for patience, tact, and devotion are unusually necessary in this work. They were given a thorough preliminary course of instruction in the hygiene of pregnancy, the causes of the mortality during the first month of life, and the great importance of maternal nursing. They were obliged to thoroughly acquaint themselves with the existing facilities for relief in all kinds of emergencies. Then they were sent into their districts. They come in touch with expectant mothers by house to house visiting, and by co-operation with the municipal milk stations (which are really baby welfare centres), relief

societies, churches, settlements, &c. As soon as an expectant mother is found, the nurse sets out to make that woman her friend, and with very few exceptions she succeeds. A careful record is taken of home conditions, family conditions, and previous confinements. The situation is then reported to headquarters, and the nurse outlines her plan of action. If abnormal physical conditions are found, the woman is advised to consult a physician or hospital, and it is the duty of the nurse to see that her advice is carried out, even to the extent of going with her patient. The field physician does not see or treat the women except under exceptional conditions. We believe there are sufficient facilities already existing. Every woman is visited every two weeks in her home, where actual conditions are seen and discussed. If relief is needed, the nurse interests the proper organization. If the bread-winner is out of work, she tries to find employment for him. If the mother must work, she is urged to do the kind which will do her the least harm, and is helped to find it. If the woman is tired out, and the home is already overrun with children, arrangements are made for the children to be sent away for a holiday. And all the time the nurse is teaching, and her advice is usually followed. Routine visits are made every two weeks. In special cases they are made much oftener, sometimes every two or three days. Through co-operation with settlements and other social organizations, each nurse has a headquarters where she spends an hour every day, and where she may be found in emergency. At her first visit the nurse leaves an addressed post card asking her to call at once, which when mailed secures a visit within twenty-four hours. As soon as the baby is born this card is sent to the nurse, often with such an addition as "My mother bought a little girl," added by one of the children. Visits are then made every three to four days, until the baby is a month old, by

which time it is expected that the mother will put herself in touch with the milk station, and keep her baby under supervision.

As has been said, the object of this work is to demonstrate what can be accomplished under existing conditions. The New York Milk Committee was instrumental in committing the city to the policy of infant milk, or welfare, stations, by carrying on such stations for a year, and submitting the results to our financial authorities. New York now boasts fifty-five such infant welfare stations under city control, and we hope in another year to see the prenatal work made a part of the welfare station programme. Careful records have been kept in every case, and up to the 1st of June of this year 1,819 women have been cared for for at least two months of their pregnancy. No cases where the supervision was for less than two months are included. We judge of our results by the number of stillbirths, the number of babies dying during the first month of life, and the ability of the mothers to nurse. These facts are set forth below.

Mothers supervised				Number	Percentage
Survived	...	...	...	1,817	99·89
Died	...	...	...	2	0·11
Total				1,819	
Babies				Number	Per m. pregnancies
Born alive	...	...	...	1,779	963·1
Stillborn	...	...	...	68	36·9
Total				1,847	
Babies born alive				Number	Per m. live births
Survived first month	...	...	...	1,726	970·2
Died during first month	...	...	...	53	29·8
Total				1,779	
Babies alive at end of first month				Number	Percentage
Nursed entirely	...	...	...	1,610	93·3
Nursed partially	...	...	...	62	3·6
Artificially fed	...	...	...	54	3·1

Making allowance for plural births, 94.1 per cent. of the mothers were nursing entirely, 3.3 per cent. partially, and only 2.6 per cent. had ceased to nurse their babies. Ten mothers of twins were nursing both babies entirely and five others partially.

Two of the women died while under observation. One death was due to placenta prævia, and the other to acute toxæmia of pregnancy.

If we compare these figures with the general statistics for the Borough of Manhattan, including the most fortunate of the population with the poorest, the results seem to be even more encouraging. The period covered is the same in both cases, so that seasonal conditions had equal influence.

			Borough of Manhattan		Supervised cases		Percentage difference
Stillbirth-rate	...	...	48.1	...	36.9	...	23.3
Deaths under 1 month	...	...	40.6	...	29.8	...	26.6

Such are, in brief, the most obvious results of our work. I realize that in comparing our comparatively small number of cases with the much greater number for the entire borough there is a certain margin of error. The stillbirth-rate for the borough is unquestionably too low, and our figures in this group include every pregnancy which terminated with a loss of the product of conception. They are certainly suggestive, to say the least.

We believe that ignorance is a very important cause of the mortality among very young babies. Such work as has been described can be carried on by any organization doing home visiting work, and of the necessity of the work being done by individual contact in the home we are absolutely convinced. Classes will accomplish something, perhaps a good deal, but personal contact will, and does, accomplish far more.

We believe in what Mr. Alderman Broadbent

has said: "In motherhood, properly instructed and respected, there is a potentiality of health and well-being for future generations beyond the dreams of the most enthusiastic sanitarian." We are trying to make expectant motherhood properly instructed and respected.

PRACTICAL WORK AMONG EXPECTANT MOTHERS.

BY MRS. FOWLES.

Superintendent of the Birmingham Settlement School for Mothers.

THE "Birmingham Women's Settlement School for Mothers" began its work in February, 1909, in the three wards surrounding the Settlement.

Its aim is to educate the mothers in home and personal hygiene, and feeding, clothing, and general care of infants, with a view to reducing the very high infant mortality rate, and making the growing infants more healthy and better citizens.

After six months it was thought advisable to concentrate the work and take for its area one ward only. This ward has an area of 184 acres, and its population in 1911 was 11,917. This gives no idea of the crowded condition of its inhabited dwellings, unless account is taken of the factories, workshops, and workplaces, which are thickly interspersed among the houses; in many cases forming part of a court of back-to-back houses.

The highest birth-rate during the past eight years was 32.7 in 1908, and the lowest 26.9 in 1904. The infant mortality rate has been never below 200 during these years. Seventy-nine per cent. of the mothers work in factories from leaving school, and 61 per cent. continue to do so after marriage, either regularly or in times of stress, caused by

sickness, holidays, or lack of employment for their husbands.

Weekly consultations are held, at which the babies are weighed, and those ailing or requiring advice are seen by one of the honorary medical advisers. The homes are visited as frequently as possible. In 1909 a club for expectant mothers was begun, and all savings of 5s. or more before the birth of the infant supplemented by a bonus of 1½d. in the 1s.

A sewing class was also begun, at which the garments for the expected infants could be made, and other necessities prepared, to ensure as far as possible cleanliness at, and during, the lying-in period. All materials supplied were paid for in small weekly payments. Very few could be persuaded to come to these classes, and other efforts were felt to be necessary.

In 1911 the Superintendent gave Monday morning to visiting expectant mothers in their homes, and collecting club savings. (Monday is the day on which the factory-working mother most frequently takes holiday.) These visits also gave opportunities for quiet talks with the mothers about their health, food, and personal cleanliness.

During 1911 forty-seven mothers paid into this club and many more were visited, but of these latter the number was not registered.

In 1912 the Superintendent found it necessary to give the whole of Monday to this branch of the work, and the following records were kept :—

One hundred and eleven expectant mothers were visited regularly, from the second to the seventh month of pregnancy, up to the birth of the child.

Sixty-six of these paid into the club, and twenty-two earned the bonus. Seventeen made clothes and other necessities at the classes, and the remainder prepared them at home, in many cases under the supervision of the Superintendent.

Twelve mothers had premature infants, five of whom lived over one month, and three are still alive, doing well.

Seven of these mothers, acting on the advice of the Superintendent, obtained medical treatment before the birth of the infants ; and in two other cases a shock and a fall were believed by the doctors in attendance to be the causes of the premature births.

By an arrangement made through one of the honorary medical advisers of the School any mother is recommended for free treatment at the Women's Hospital if unable to pay the registration fee of 2s. 6d. The Maternity Hospital, which is situated in the ward, is also a great boon to the mothers, and those whose conditions make it necessary that they become in-patients learn valuable lessons while quietly watching the daily routine. The out-patients also are taught many very necessary lessons by the midwives and pupils in attendance at their homes.

A private Society provides any nursing or expectant mother, recommended by the School, with daily dinners at a charge of 1d. per day, or free of charge if they are very poor. Too much cannot be said as to the opportunities given for getting at the very real difficulties of the expectant mothers during these home visits, and valuable lives have been saved through timely advice and help given.

In one case an expectant mother in her sixth month of pregnancy was found to have developed erysipelas in her throat and face. The week before she had complained of a cold and sore throat. Her only attendant was a young married daughter, who became much alarmed when the doctor notified the case, and an inspector visited the home from the Council House. On the third daily call of inquiry the Superintendent found the woman alone on a couch, partly delirious. Her husband was sent for from work, he went to the doctor in attendance and

procured a recommendation, and the woman was removed to the Infirmary the same day. After a very severe illness she came home for two weeks before her confinement, and returned to the Infirmary when labour set in. Twin babies were born, who weighed 5 lb. 2 oz. and 6½ lb. at two weeks old.

In another case a mother in her sixth month of pregnancy was found ill, and advised to call in her doctor. He removed a macerated foetus within twenty-four hours, and the mother made a good though slow recovery. Other cases might be quoted, but time and space forbid.

Many mothers have been enabled to nurse their infants through following advice given, who had not succeeded in doing so with previous infants. The pleasure of a mother is very marked when she shows her newly born infant to the visitor who has taken a friendly and practical interest in her during the long months of pregnancy.

A very difficult part of this work is dealing with a large moving population of the lowest type, who inhabit furnished places and cannot easily be traced after their frequent removals. These mothers seldom go to work, are very poor, and very dirty. Another difficulty is the habits, traditions, and superstitions handed down from previous generations, which sometimes cause the mothers to hesitate about seeking really necessary advice and treatment. The practice of taking large doses of gin and Epsom salts in early pregnancy is often met with.

Where diachylum has been taken the mothers are warned that it is illegal to do this.

Only persistent friendliness gains the confidence of the mothers in these matters, but this once gained, the results are very far-reaching, not only in their own lives but in their influence among their friends and neighbours.

DISCUSSION.

Dr. SMITH (York) said the subject of pre-natal hygiene was specially interesting in connection with stillbirths, and in his own city they had for some years checked the notification of stillbirths by a voluntary arrangement with the Registrar of their cemetery, by which the Registrar every week sent him a statement of the stillbirths which had been buried, and furnished him with the names of those who had given the certificate of burial. They were able to check this along with their notification of stillbirths under the Notification of Births Act. They found that a very useful means of checking the stillbirths received under the Midwives Act also. A certain number of the stillbirths either notified under the Midwives Act or under the Notification of Births Act, or by the Registrar of the cemetery, were selected, and his health visitors visited the midwives who had attended the cases, and made close inquiries as to whether in the first place they had seen the child born. That was suggested by a case where a midwife gave a certificate of birth and had not seen the child born—she was called in after the birth. They also inquired as to the condition of the child at birth, and also what efforts were made to resuscitate life. They had found this very useful indeed, and the talks which the health visitors had had with the midwives in connection with these cases resulted in a considerable amount of education of the untrained midwife. Another valuable thing in towns was to form an association of the certified midwives and link it up with one of the National Midwives Associations. In his town they had meetings every two or three months, and papers were given sometimes by himself, and sometimes by one or other of the medical practitioners, or by some of the more advanced certificated midwives. It was a mutual improvement society as well as a sort of trade union amongst the midwives themselves, and it had a very great educational influence which he found was of help in the prevention of infantile mortality. There were so many different institutions and associations working in the direction of preventing infantile mortality that they tended to tumble over each other in the course of their work. There was a very great need at this time, now that they had got so far in this great work, for a linking up of all these various agencies under some representative committee or some such thing as a Guild of Help. He thought it was becoming very vital, for there were schools for mothers, restaurants for poor mothers, infant consultations, the work of the official corporation health visitors, and all the other

agencies which were doing work in the direction of the prevention of infantile mortality. He hoped that as a result of this Conference there would be a desire to try and promote such linking up, and if anyone had had experience of this he trusted they would give the Conference the result of their experience.

Miss CURTIS (Leeds Babies' Welcome) asked to be allowed to say a few words about the work they did in Leeds for the expectant mothers. During 1911-12 they had 200 expectant mothers on their books. The way they got into touch with them was by co-operating with the sanitary authority, who with the infirmary notified their cases to them. The Maternity Hospital and the West Riding District Nursing Association also notified their cases, and so they prevented overlapping. They had a class for expectant mothers, at which they had discussions. The mothers would ask questions, whilst they also asked the mothers questions. In that way they kept in touch with the mothers. One discussion was entirely devoted to the subject of miscarriages. The mothers thought they were not at all important, but at the end of the afternoon they were all very much wiser. Besides this they visited the mothers at their homes. One of the greatest difficulties in getting hold of the expectant mothers was that many of them were "home workers," and these worked up to the last moment.

Miss HELEN G. KLAASSEN (Camberwell School for Mothers) said she had been interested in maternity clubs for a long time, and there were many of them of the old-fashioned type in different parishes in London, and of late years some of these had tried to improve their work by watching pregnancy cases. She had been asked to say what should be done with maternity clubs now that the maternity benefit was in operation. How could they do the visiting of pregnancy cases without knowing how to find the women? In future they would not have the opportunity of visiting the homes for the sake of collecting money for confinements, and consequently they would lose their chance of doing what had been so well described in the two papers that day. She had come to the Conference partly in the hope that some suggestion might be made as to how they were to get at these cases in the future so as to be able to do the work. She wished very much that the cases could be notified beforehand to the approved societies, so that the latter might interest themselves in this kind of work. If she might say one other thing which she did not think had been touched upon in the papers, it was as to the very great difficulty experienced in the case of the

casual labourers, those who were chronically out of work, or extremely poor. They had been told by Mr. John Burns that the mortality in this class was enormously higher than in any other classes, so that the question of poverty was really at the bottom of a very great deal of the infant mortality. Under their existing law the able-bodied man and his family were not helped under a medical order. She did not know whether other workers knew of any unions where if a woman was suffering from prolonged under-feeding she could be dealt with by a medical certificate. She was not a doctor, and did not know whether doctors would say it was a possible thing to do, but looking at it from a purely social point of view it would be a good thing. She had been very distressed at different times about many cases, but she might say in this connection that the woman she felt very distressed about went for her confinement to the York Road Hospital, and when the baby was born it was the biggest baby in the hospital.

Mrs. MODEL (Sick-room Helps Society) asked in connection with the wonderful statistics they had heard whether it was not the fact that the foreign mother in the poor districts of New York very rarely went out to work, and could consequently nurse her own infant. From her experience in London amongst the foreign population they had absolutely no difficulty in inducing the mothers to nurse. On the other hand they did find difficulty in inducing them to feed artificially if on account of tuberculosis or some other reason it was considered they ought not to nurse the babies themselves. She would like to know from Dr. Van Ingen whether it was not largely foreign mothers he was dealing with, who owing to their tradition were inclined to nurse their infants themselves.

Mrs. ROGER GREEN (Burton-on-Trent Health Society) said she would like to say something in respect of the question raised of the co-ordinating of social effort. In Burton-on-Trent they had started a scheme and the Health Society was responsible for this. They had only been at work two years, but she must say that so far they had succeeded in gaining the confidence of other societies. They had a General Welfare Council of their Society, and they had taken it on themselves to do this. She dared say they all found the same thing, that if they looked at the reports of the various societies in their towns for the last forty years they would find one object common to all, namely, the co-ordinating of every other society. (Laughter.) On their present Health Society they had representatives from the Mothers' and Babies' Welcome.

which was a branch of their own; they had the Chairman of the Infirmary, the Chairman of the Children's Care Committee, the Chairman of the Board of Guardians, the Chairman of the Education Committee, the Chairman of the Health Committee, the Chairman of the Charity Commissioners; and in fact they had every social factor represented on the Board. Theirs was a little place with a population of some 48,000, and their problems were all within the scope of the ordinary social worker. One of their main objects was the calling together of little conferences to discuss the difficulties they met with in their work. They were just about now to call together a Conference on a very difficult subject for a small town, and this was X-ray treatment. They had X-ray diagnosis but not treatment of the children's care cases, and they were calling together a Conference of the various bodies to see if they could not send their X-ray cases to a near town. There was one question, however, which she very much wanted to ask. Nobody at that Conference seemed at all worried by finance, but at Burton it was a very difficult problem. They had excellent papers on all sorts of subjects, and they had had nothing to tell them how to get the money. She would like to know if anybody present got any work from the Board of Guardians or got any grant from the Board of Guardians. It was stated in that excellent little paper, "National Health," that in some foreign countries the Poor Law authorities gave grants for work done; and seeing that the taking of the children when the mothers had to go out to work was of great assistance to the Guardians, she wondered whether the Board made such grants. She was thinking of applying to the Board of Guardians for work and a grant.

Miss EGGLESTONE (Health Visitor, Hammersmith) said the Conference was very interesting, and they found out so many things which were happening, and she had found many things in Hammersmith which she did not find they had in provincial towns. They had a dining-room for expectant mothers, and convalescent dinners, both administered by the Kensington Association. This meant that if the mother was not insured, and the husband was out of work, the former could have fourteen dinners. Mrs. Willey had established several dining-rooms in London, and she (the speaker) asked her to establish one in Hammersmith, which she had done. They supplied a dinner for 2d. if the husband was in work, and if he was out of work and the family was in poverty it was given free. If they were getting a little work they expected them to pay a

penny. They had formed a committee and different ladies served on different days. They only paid for the cook and the rent, which was guaranteed by Mrs. Willey. The dinners consisted of two courses. One day they had cottage-pie, which meant potatoes and meat with a crust. After that they had blancmange and jam with a cup of tea. They gave them a good supply, and the mothers often testified that they had never had anything that had produced so much milk. They did not give meat every day, but only had it about three times a week. On other days they had lentil savoury with bread crumbs and with thick brown gravy and vegetables. After that they had suet pudding with either jam or treacle, and always a cup of tea afterwards. They found the babies got on admirably. They not only provided for the mothers after the birth of the baby, but the expectant mother also from the fourth month was fed up to the time of her confinement, and as the result they found there were no prematurely born babies, but healthy, strong ones. They had had this system now running for two years. They linked up all the other things with the dinners, and it was reported to the various agencies, so that there was no overlapping. She knew what dinners were given by other societies and what parish relief had been given, and so knew exactly how much relief any mother had had both whilst in bed and after she had got up.

Mrs. GREENWOOD (Sanitary Inspector, Finsbury) said that in her work in the last ten years she had taken systematic notice of the infant deaths in her borough, and one who did such work could not fail to be impressed with the enormous number of deaths which took place—deaths which could only be prevented by work amongst the expectant mothers. She had been enormously impressed with the importance of the instruction of the expectant mother in pre-natal hygiene. She had been fortunate enough on several occasions after investigating a death to give the mother such advice that later she had been able to bring forth a living child, and she had afterwards been called into the house by the mother and shown with great pride the baby she was nursing, and which the mother had said was due to the advice she had given her earlier, and which had led her to seek medical advice. In the borough in which she was working there was not the slightest difficulty in getting hold of the expectant mother, but the difficulty was to get workers who would follow up the cases. In her borough they had herself and two health visitors, and some time ago an attempt was made to deal with the question. One of the health visitors used to go to St.

Bartholomew's Hospital every Thursday morning, when the mothers came to get their letters, and without any difficulty at all she used to get a long list of expectant mothers. But the fact was that the officials had not the time to follow up these cases and visit them, and therefore an organized body of workers was needed. They wanted volunteers to work amongst these expectant mothers. Then they had the City of London Lying-in Hospital in their area, and through the officials there they obtained a list of expectant mothers. On the other side of the borough they had the Royal Free Hospital, and that hospital was doing work amongst expectant mothers in so far as it had a dinner centre, and the mothers who went to the hospital could be sent on for free or paying dinners if necessary. But the feeding of the expectant mothers was only one part of the work, and there was a great deal of other work to be done. They had also an ideal landlord in their borough, who provided nurses to visit his tenants, and they visited them continuously whenever it was necessary, and this landlord had also started a Provident Club for expectant mothers for the provision of baby clothes and the cradle. There was an enormous field of work and no difficulty in the London boroughs in getting hold of the expectant mothers if only the voluntary workers would co-operate. They had no difficulty in getting hold of the material if only they could get workers with the time to work amongst the women who really needed advice. Anyone who investigated the deaths could not fail to see that a great deal could be done. She did not agree with what Sir George Newman said the previous day, that they would not expect the mortality figures to be much lower, for she was convinced that it could be brought very much lower.

Dr. TRUBY KING (New Zealand) said he had followed the papers with the deepest interest, and especially that of Mrs. Fowles on practical work amongst expectant mothers, and the remarks which had been made by other speakers with regard to this most important aspect of the question of the safeguarding of the mother and child. One was satisfied, of course, that all these various agencies which were working with a common object and on very similar lines were all doing a great deal towards the solution of the problem which they all of them had at heart. But there was one point which seemed to him to be of supreme importance which had not been specially touched upon, and which in their experience in New Zealand was an even more difficult matter than the procuring of suitable food for expectant mothers. He quite understood that those speaking had

dealt with very crowded cities. In the Old World they had to contend with a state of affairs in which very often there was an actual shortage of food, but taking the whole population of this country that would not apply any more than it applied in the Colonies. The great mass of the people had a sufficiency of food for themselves and their progeny. Taking the world generally they had to do with people who could obtain and did obtain a sufficiency of food and in many cases took an excess of food. Dr. Ballantyne remarked in his great book on "Ante-natal Hygiene" that the common counsel given to mothers to eat for two was one of the most insane counsels ever given, because the weight of the mother with her child was practically not more than the weight of the mother without. He meant that a variation of half a stone of weight, which was the utmost, was a very small variation, and therefore the extra food required was very small, and as most people tended to eat too much under modern conditions, the ordinary diet was quite sufficient. But what was universally agreed by all who had to do practically with this subject was that a more important matter for the expectant mother was that she should have proper and regular feeding habits, and above all things that she should take sufficient exercise, keep her bowels properly regulated and see that she had proper rest and proper surroundings. These were unquestionably the most important factors with regard to the expectant mother. He would like to point out one or two things which did seem to him to throw a most important sidelight, if it could be so called, upon two most important subjects. With regard to the question of exercise, which he thought was so relevant, he might tell them that he was speaking at a meeting of the Farmers' Union in Wellington and was dealing with the question of rearing dogs' offspring. This was an interesting matter for those engaged with the proper care of flocks and herds. An old shepherd came up to him and said, "You are perfectly right with regard to the importance of exercise for dogs; with regard to sheep dogs it is our experience that unless you keep them working with the flocks right up to the time the pups are born we find that the mother does not do well and particularly we find that the pups do not do well." He was interested to know if that really was the fact and why, and so he wrote to the Hon. J. G. Wilson, who was the head of the Union and was himself a large holder, and asked if what he was told was the fact. He replied that it was absolutely the fact and all the shepherds worked the mothers practically right up to the time the pups were

born and recognized that it was of paramount importance. Well, now to deal with horses. On the farms all over the world it was the recognized practice by those who understood their work that the farm mares should be kept working right up to the time when the foal was born. Sometimes the mare was worked right up to the very day that she was delivered of the foal; although, of course, the work was not the ordinary work. For instance, if they were heavy draught horses they were kept at light work, but still they were kept steadily at work every day, and the more valuable the mare the more anxious was the farmer to see that she was safeguarded in this way. He did not pay particular attention to feeding, but he paid every attention to the fact that she should be kept in reasonable condition and properly exercised. To deal with another class of horses—racehorses. A man who had to do with a large stable communicated this: "In regard to our stud we had a farm where there was rich pasture and they were supplied with good feed and they had not much exercise in the paddock. We found as a result that we had to deliver by hand quite a considerable number of foals. The mothers had not sufficient vitality to bear their progeny in the ordinary way and they had to be helped by similar means as were necessary in regard to human beings. Giving them a large amount of exercise did away with all that." As regards sheep, if they had heavy pastures with scanty feed they did well, but if they had good pastures where the sheep did not have to go far for their feed they did not do so well, and it was the practice with regard to sheep so conditioned to turn the dogs in on them to hustle them about and so make them have sufficient exercise. So all round they must come to the conclusion that this matter of exercise was most important. And they must remember the great dislike of the human being to take exercise. From the beginning of language the word synonymous with labour was pain. They all tried to loaf and they would all have to try and get rid of that habit.

Dr. SMART (Aberdeen) said that with some trepidation he wished to join issue with the last eloquent speaker and this was with regard to the influence of nourishment on expectant mothers. Dr. Truby King fortunately lived under different conditions from those of this country. He (Dr. Smart) had clinical charge of a large consultation in Aberdeen where they had some 300 mothers, and he must confess that over and over again on consultation day he found many of these mothers suffering from want of food and absolutely unfitted to nurse their children because

of that. The medical officer of health of the borough or the area in which such an association was working ought to have supreme administrative control. Too often the medical officer of health had no time, and perhaps no inclination, to undertake the clinical work, but he did think the administrative control ought to be in his hands. With regard to the financial question, this was a public health work and they ought to look to the municipality for the money to carry it on. Many of them were doing the work voluntarily in a honorary capacity and they were glad to do so, but why when they did the city's work ought they not to get also the city's pay? Aberdeen at first had great difficulty in getting the necessary funds. They had to get ordinary charity to help them to go on. Then they went to the Council and told them they were giving them less than they would give to a swimming club, and yet they were saving hundreds of lives. Now they had taught them better things, and they saw it was really part of their own public health work and they were financing them, and he thought they would find there would be no difficulty about the money. He would like to say one word about the registration of stillbirths. His interest in the work was clinical purely, but he felt that in this matter notification of stillbirths was not enough, and registration of stillbirths was not enough. They wanted to go further and have registration of abortions. They wanted to have registration of pregnancies and then they would be able to do something to check this terrible loss of life before birth. He felt that this was one of the most important parts of their work. He did not know what their practice was in England or the Colonies, but in Scotland they did not need to have any registration of a stillbirth. That was to say they did not require to give any certificate. It had to be notified according to the Notification of Births Act, but the mother or the father could send to the cemetery authorities and get the latter to come and take away the baby.

Miss ETHEL BROWN (Infant Protection Visitor, Hornsey) said she had only one short question to ask. The two papers had dealt with schools for mothers. She would like to ask whether there should not be some kind of institution or recognized school for young men about to be married.

Dr. WALLER (North St. Pancras School for Mothers) said he would like a little more information on the point of ante-natal hygiene. There had been a tendency to look on exercise and work as a bad factor in the pregnant woman. He was not at all sure that it was. It was his habit to give advice to a pregnant woman

to go on working nearly all the time to her confinement. He thought it was often better for her to go on working whilst she was suckling the child. That he knew was in opposition to many of the views they had heard that day, but he could not help thinking that nutrition must be allowed to keep its proper place in this subject, and that went very often hand in hand with work, for the fact of a woman working was often the only way of getting nutriment. It was often a serious thing to advise the woman to give up work. He had had a case lately where the superintendent of his school for mothers advised him that a woman was in a much better state of health when she was at work during pregnancy than when she was not working. Another point on which they had gone a little bit astray was on the question of abortion and miscarriage. He was not at all sure that they must look on every abortion and miscarriage as a misfortune. It was very often a protective mechanism on the part of the mother and certainly in cases of syphilis. Where the virus was very active it was better for the mother to miscarry than go the full term and bear the child. He did not think they ought to be too hasty in condemning every abortion and miscarriage as a misfortune, and he would like to hear Dr. Van Ingen's views on that subject.

Dr. ADAMSON (Hetton) said he rose with considerable diffidence to add his quota to what was a most interesting discussion. He had lived a strenuous life and taken a part in many confinements and had had charge of all sorts of conditions of women in labour. The first and great thing which struck him was the importance of exercise for the expectant mother. He had always viewed with very great alarm, whatever might be her social position, or whatever duties she had to perform, the lady who resorted to the sofa and could not be seen out, and worst of all, the woman who was ashamed to be seen out because of the evidence of her expected motherhood. With regard to the latter class, the one thing he could not call them was women. He did not recognize such a woman as what he would call a womanly woman. There was no doubt but that the advantage of exercise was very great. The probabilities were that the woman who kept about—the wife of the workman—would have less trouble when her hour of trial came than the woman who gave way to the feeling of lassitude and of unwillingness to move about. He did not forget for a moment that there were many so frail that it was absolutely necessary for them to rest, but even these women ought not to rest continuously if they could possibly avoid

it. Another thing he had impressed upon expectant mothers was that upon them there was a duty to produce a healthy young life to this world, and that from the very beginning it was for them to do all they could to make it fit to fight life's battle.

Dr. A. E. NAISH (Sheffield) said that at the risk of flogging a dead horse he rose to speak on the question of work; because if mothers were turned more or less into invalids the general result would be bad. He thought Dr. Truby King's speech on the subject was extremely interesting. In the first place, one knew that the breast feeding amongst the upper classes had become very much less than amongst the lower classes and they might say that a very large amount of this was due to unwillingness, but the evidence of people like Dr. Holt all pointed very much to the fact that very largely the better and upper classes had not the ability for breast feeding. If that be so, surely it must be due to some factor in the way they lived, and he thought it was in favour of the evidence of the need for taking plenty of exercise. Then he had distinct evidence in many cases where he had been seeing people who had been suckling their children and where they had rather a poor supply of milk. It had been tested and the quantity taken, and he had found quite definitely that where they took regular simple daily exercise in the way of going out for a walk it made a good deal of difference. They actually had more milk and the child was more contented on the days on which the mother took definite exercise. Then he had felt sure that women who suffered from vomiting would suffer less if they adopted a different plan in their next pregnancy, and the experience in almost every case was that if they rose early in the morning and got about their daily work, if it did not stop the vomiting, at least they were less troubled and they did better during the pregnancy and better during the confinement and had on the whole a better time afterwards.

Mrs. ROGER GREEN (Burton-on-Trent) said she would like to ask for a definition of exercise. Exercise and the work of the mother in the home were two very different things, and when they talked about the possibility of turning the mangle they got nearer the point. That was a matter which had a great bearing on premature births. Exercise in the minds of the medical men and exercise in the case of the working woman were two different things.

Dr. ERIC PRITCHARD (London) said he was glad the question of exercise had been discussed, because he had felt all along that nothing promoted the health of the child

so much as a moderate amount of exercise taken by the mother, and he had had an excellent opportunity of judging of the effect in the borough in which he worked, because a very large number of women who attended his consultations were women who went out charring. They scrubbed the pavements outside the large houses in Oxford Street and Regent Street, and it was really hard work. These women had their dinners provided and very often their teas as well; moreover, were very well paid for their services. These working women were *par excellence* the women who produced the best children, and he had never found any evil effects from that sort of exercise. As for turning the mangle, he was not prepared to make any statement with respect to its influence, but with regard to scrubbing he could say these women bore extremely healthy children and in great contrast to the other class they had in Marylebone—namely, the women who led sedentary lives in workrooms, tailoring, and so on. This latter class of women lived without exercise and they produced children who gave one a considerable amount of anxiety. He was sorry that in this discussion the question of the effect of alcohol on the foetus or the child had not been taken into account, because, in his opinion, it had a more evil effect than all other detrimental effects combined, including even starvation. He consulted all the mothers who came to him as far as he could, to try and obtain their histories with respect to habits of drink, beginning with the alcoholic history of the father, if he had one, or the history of sobriety, if he had one, and also as far as they could the history of the mother. One knew one could not rely very much on such statements, but often they got confirmation by the subsequent visits of health visitors or the sanitary inspectors. In this way he had got a large and long record of the influence of alcohol. He had not worked it out yet, but so far as he could see it had more effect than everything else combined.

Dr. P. JOHNSON (Medical Officer of Health, Stoke-on-Trent) said he wanted in one word to emphasize the importance of the subject of syphilis and to express the hope that the International Congress of Medicine would face the matter and deal with it in a very thorough way and not, as had been indicated by Dr. Saleeby, as a subject to be tabooed. His attention had been particularly drawn to the question in dealing with cases of ophthalmia neonatorum. They had in Stoke-on-Trent a very complete system of notification of that disease and he found that it was a disease very amenable to treatment except when

complicated by syphilis. In those cases the result was very often most serious, but they had the comfort—a mournful comfort, no doubt—that the child would probably die. They found that was a very frequent result in cases which went blind—in a short time afterwards the child died. A speaker also expressed the opinion that in cases of abortion, perhaps, they had often to congratulate themselves that abortion had occurred, because otherwise children would be born maimed by this disease. That simply brought out what he wanted to emphasize, which was the importance of dealing with the question of syphilis and the importance of pre-natal treatment.

Dr. BEATRICE MACGREGOR (Wimbledon Mothers' and Babies' Welfare Society) said the fact that they did not really know whether abortions or stillbirths were beneficial or not was one which made them want to have a Commission to inquire into the whole subject, and if possible to have a Bill for the Registration of Stillbirths. There was great ignorance on the subject, but the evidence was all in favour of the necessity of knowing a great deal more about these things. It was to be hoped they would pass a firm resolution in favour of the registration of stillbirths. One lady had suggested that they might get over their financial difficulties by appealing to the Boards of Guardians. It would be a great misfortune, she thought, if the work of this sort was put under the Poor Law. It was a matter of public health and it ought to be the borough councils and such like bodies who should supply the funds as they did in Wimbledon. They ran a *Welcome* in Wimbledon and they believed they did a great deal of good, but the difficulty was to touch all classes of the community. It was an extraordinarily difficult thing unless they got lists of mothers from hospitals, of expectant mothers, and this would not be possible in the country. The great difficulty was to get into contact with every woman as they would like to. The people they touched were the poor people who had aspirations, but they wished to create aspirations in people who had not got them now and who would not trouble to come to them. There were also a number of people above that class—the wives of the respectable artisans—who did not care to be seen going to these sort of places at all. That was a class very much in need of instruction, but it was not in the least reached by their work. As to the question of exercise, it all depended, of course, on what the exercise was. There was nothing better for a woman than the ordinary duties of the household, and she had nothing to say against the ordinary duties of a

household carried on outside the household, but it was an altogether different thing if the woman had to stand in one position all day. The sort of exercise referred to by some of the speakers was altogether a different thing from the mechanical life which women had to undergo in factories or laundries where the work necessitated standing all day in one position. They did encourage the women as much as they could to carry on their ordinary household duties up to the very last minute before they went to bed.

Dr. MOORE (Huddersfield) said he would like to suggest to Dr. Macgregor that in the Notification of Births Act they had included in fact the registration of stillbirths. It did not include abortions, but they could obtain reliable statistics as to the proportion of stillbirths in those localities where the Notification of Births Act was in operation. He hoped that the particular disease which had been engaging so much of their attention would not assume in relation to the general subject of infant mortality an importance greater than from the pure scientific point of view it ought to receive. It was an evil of immense importance from another point of view, but strictly in relationship to the number of lives which it destroyed amongst infants it was not, in his opinion, a subject of very great importance. If they had unlimited energy and unlimited resources, if in the communities where they lived there was an abundance of money forthcoming for all sorts of work in connection with infant mortality, then naturally this subject would receive complete attention and everything would be done which was possible to limit the ravages of the disease, but in the majority of cases he did not think that was the case. In his opinion it behoved them rather to tackle first those causes of death amongst infants which were the more readily grappled with and which they might the more speedily expect to deal with successfully. It was a pity to waste a lot of energy. He would not say waste, but it was a pity to expend a lot of energy in attempting to eliminate from the death returns a disease which, if they were able to eliminate it altogether, would only reduce the death figure by perhaps a decimal per cent. or one or two per cent., when there were causes of death which they could at least as easily or perhaps more easily eliminate, and which if eliminated would reduce the total figure by perhaps 10 or 15 or 20 per cent.

A DELEGATE wished to emphasize what Dr. Macgregor had said, that it would be a great pity that an impression should gain currency that this Conference considered work before labour beneficial, and also as one speaker suggested

during suckling. It was very possible that in certain circumstances work would only be exercise, but there should be a marked distinction drawn between work and exercise. No one disputed the fact that exercise was necessary, but working in a factory or laundry, in his opinion, was extremely bad and was contrary to the views so eloquently put by Mr. Burns. Surely the ordinary household duties were sufficient exercise, and he thought the man who wanted his dinner could very well take the place of the dog whom they had heard from Dr. Truby King worried the sheep to keep them in good health. (Laughter.)

Miss LLOYD (Birmingham Infants' Health Society and School of Mothercraft) asked if they had clinics in connection with the schools for mothers in England such as they had abroad. There was an excellent one in Paris.

The CHAIRMAN said that they would understand that he looked at the matter from the medical point of view, but it would be readily seen from the papers which had been read that they had somewhat similar conditions across the ocean to what they had in the old land. Dr. Van Ingen had spoken about density of population and they had density of population in Canada and in the United States and in Great Britain, and the Government Departments and municipal authorities had great difficulties to deal with in this matter. In that respect they were all alike, whether it was the new cities of Winnipeg, or Regina or Edmonton in the North-West, to which they sent thousands. They found density of population, and he told them there candidly that the environment in certain seasons of the year was infinitely worse than in Great Britain.

A DELEGATE said that Dr. Smart, of Aberdeen, had told them he managed to get a grant from the Council. She would like to ask whether it was from the education authority or the sanitary authority.

The CHAIRMAN said that with regard to the whole of this work of the prevention of infant mortality, he would like to impress on them that it was really a public health question. At present it was being carried on, and for a long time had been carried on, on social lines, but if hygiene was worth anything they should begin with the ante-natal period and go on through infancy right up to childhood. They were watching Great Britain and all other countries who were carrying out the work of medical inspection of schools. They were carrying on public health work through medical officers of health and municipal authorities, but they had neglected that part of preventive medicine which was ante-natal and until the child became

of school age under the State. In answer to the New York doctor, he would suggest there was a very fitting point where he could co-ordinate all the social workers. There would be social workers until the end of time and they could all hope they would multiply. In religion they had all kinds of Churches and they were multiplying every day. Years ago they laughed at the Salvation Army, but that body had done an immense amount of good. All this work must, in his opinion, be co-ordinated through the medical officer of health. Of course, the work could not be done by that officer, but would be done by the official of the particular department. He might give as an example the case of Toronto. There the health officer had co-ordinated all the tuberculosis work under a lady, and she had qualified nurses well adapted to carry on the work, and she was doing excellent work and finding social workers willing to engage in this particular work. Then as to sanitary science in Ontario, which was certainly an English-speaking province, the Provincial Government gave aid to certain institutions which came up to a certain standard; and, further, their municipalities assisted work of this kind. He thought that no nation could spend money better or more wisely than for such purposes. It was along preventive lines that they ought to work, for it meant that the more they spent on the mother and child the less they would have to spend on their workhouses and infirmaries. This was wise economy. He would like to say one more word with regard to stillbirths. It had been his fortune to be a Registrar-General, and he had always put forward the view that stillbirths should be registered. When the law was in act of revision in Ontario he had to appear before the Court of Judges and discuss this very question of registration, and his contention then was that a birth was a birth, whether it was a stillbirth or not, and therefore ought to be registered. He also claimed that it should be registered as a death or otherwise it should not be buried. That was the law in Ontario to-day. The body could only be buried in the cemetery on presentation of a doctor's certificate. It was quite evident that there was a difference of opinion on this point, but he did not think the difference was very great. The other point on which there had been a great deal of discussion was that of exercise, and the question was raised as to what was exercise. The man who went out on horseback every morning did so for exercise. The lady took a walk with a little dog, and that was her exercise. But the woman less fortunately circumstanced in life had to go to a factory and that was

not exercise. That was labour; it was work. That woman also wanted feeding. She was undergoing an extra strain, particularly during the period that she was carrying a child, and certainly if she was working to earn her daily bread she required feeding to compensate for the extra loss. He only trusted that as the result of that Congress the people of England, the people of the United States, the people of the Overseas Dominions—the men as well as the women—would study a little more carefully and would become better educated in all that appertained to the baby. As men and women they knew more about the dogs and horses and more about the breeding of cattle than they did about the raising and feeding and caring for children. It was a calamity and a shame to English-speaking people that such was the case. They had to raise children if they wanted to have nations and the sooner they came out and talked one to another the better. He only trusted that as the result of the meeting that morning there would be a great uplifting in this matter and that they would each go back to their homes feeling that they had brothers and sisters helping them in that great movement.

Dr. VAN INGEN, in reply, said it was a little difficult to answer positively the question asked as to the number of women working away from home in the districts which he had referred to in New York. From the statistics which they had and which he was sorry to say were incomplete he would say that about 30 to 35 per cent. of the mothers were working away from their homes. Unfortunately the figures they had compiled themselves were rather complicated and he could not have the 1,800 cases tabulated in time to bring the result with him, but from the work which had been done by others he would say the percentage he had mentioned was probably correct. It was true that maternal nursing was very prevalent in these districts, but he was sure it was not so high as 93 per cent. From a good deal of work which he had done in the dispensaries for children in past years he felt pretty certain that maternal nursing was not so high as that amongst these poor women. Of course, the Italians almost always nursed their babies and he admitted that maternal nursing was almost universal in the Italian districts. The mother would nurse at night and hand-feed in the day time. They started three years ago and carried on a very extensive campaign in regard to infant welfare stations, and as the result of that the City of New York, after a year's fight, appropriated £30,000, and they had now fifty-five of these stations in the Greater City of New York run entirely by the city. Their purpose

was to force the city to take on ante-natal work as part of the duty of an infant welfare station, because they thought that it properly belonged to it. The question of finance had been brought up and, of course, was a difficulty in every country and in almost every city. But the expense of the work they were doing was very small. It only meant the salary of the nurse and her travelling expenses about the city. The result of their efforts was to relieve hospital and other work and it was already compelling the existing organizations to come forward and play their parts. He was asked to state whether he considered every abortion or miscarriage was a misfortune. He thought that every abortion and miscarriage was a misfortune, because he thought it was the condition which caused the miscarriage which was the misfortune. He did not think it was necessary for him to go into the subject of exercise and work again; except to say that they did not have any difficulty with the class of women they worked with in seeing they did not over-eat, and also there was no difficulty with regard to their over-resting themselves.

Mrs. FOWLES said that in relation to the co-ordinating of different societies in Birmingham the Charity Organization Society issued every few years a list of relief societies. When they began their work they realized that they were an educative association—a school for mothers and not a relief society—but as they wished to help the mothers to help themselves they co-ordinated with the other societies either by representation on their committee, or by having at any rate friendly relations with them all. That seemed to her very much the better way, especially in view of the great poverty of most of their associations and societies. It was even difficult to obtain the money for the rent of the premises and the salaries of one or two trained helpers. In that case, to be able to apply to different societies, who were as keen about their part of the work as they were about theirs, was very helpful. As to the point raised about thrift clubs and the getting hold of expectant mothers she might say that for the first three months of the year she found their thrift club fell off considerably in numbers. When she suggested saving, she was told over and over again by the women that they had got the 30s. By the fourth month in the year she found that many of the mothers were beginning to realize that 30s. was not a fortune and by June a great many were seeing that an extra few shillings would be a great help in the home; so that in July she got back to the maximum amount which she had formerly received in the thrift club. The people were finding out that 30s.

did not do everything and they were quite willing to come and pay into the club again. On the matter of the working mother, Dr. Robertson, the Medical Officer of Health in Birmingham, in 1910 had a list of factory working mothers and he found that the infant mortality was lower amongst the factory-working mothers than with the non-working mothers. This very much astonished everybody, but he put it down to the fact that the mother who worked in the factory had some shillings a week extra for food and the necessities required in the home, and also to the fact that the mother who would go to work rather than see her children need had more grit and energy than the mother who would not go to work but stopped at home. But no one could visit all these homes without realizing that the strain of factory life did affect the expectant mother. One woman told her that for forty-three years she had been engaged in work which had necessitated four muscular movements only, and surely that could not fail to have an effect on both the body and mind of any mother?

CONGENITAL SYPHILIS AS A CAUSE OF INFANT MORTALITY AND THE PRE- VENTIVE MEASURES NECESSARY.

By F. W. MOTT, M.D., F.R.S., F.R.C.P.

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FOR sixteen years past, as pathologist to the London County Asylums, I have been engaged (during other researches) in showing that the essential cause of general paralysis of the insane is syphilis—congenital or acquired. I was led to this conclusion by the study of a large number of cases of general paralysis occurring in early life, thus precluding the possibility of the mental disease in these cases being caused by alcoholism, sexual excess, and mental stress in its many forms, which were the causes usually associated with general paralysis. The age of the onset of the mental symptoms in the majority of these juvenile cases precluded the probability of syphilis having been acquired. Ten years ago I made careful

records of more than forty cases of the juvenile form of this terrible malady and about one-half of the cases showed signs on the body of congenital syphilis, so definite that there could be no question of syphilitic infection. The history obtained from the mothers in practically all the cases showed that syphilis could not be excluded as the cause. The usual history was miscarriages or abortions, stillbirths, children dying in infancy of convulsions, marasmus, meningitis, or hydrocephalus; then follow children who were *apparently* healthy, but who in later life developed syphilitic disease, manifested often by progressive blindness from atrophy of the optic nerve, inflammation of the cornea of the eye causing opacity, nerve deafness, bone, skin, and visceral lesions. The children may be stunted in growth and show obvious signs of congenital syphilis in the form of notched and pegged teeth, saddle-shaped nose, linear scarring around the angles of the mouth and bosses on the skull. At puberty the genital organs remain undeveloped, and this genital infantilism is frequently associated with various grades of idiocy or imbecility. Children presenting these well-determined signs of congenital syphilis may subsequently develop juvenile general paralysis of the insane, locomotor ataxy, blindness from atrophy of the optic nerve, epilepsy, chorea, hysteria, meningitis, imbecility, and idiocy. But it is more common to find the children of syphilitic parents born later *apparently* healthy and showing no signs on the body of syphilis; these, however, in later life, especially when the stress of puberty arrives, may develop various nervous affections, including this juvenile form of general paralysis.

A year ago, at the Royal Society of Medicine, when a discussion was held on syphilis, I was entrusted with the task of an opening "Address, with special reference to the Relation of the Disease to

the Public Health, including Congenital Syphilis," and I presented a large number of family histories upon which the before-mentioned conclusions were based.

It is appalling to think what a number of adults there would be suffering from the effects of congenital syphilis if it were not so fatal to the developing embryo and to the offspring in early life. Consequently all the while this disease is prevalent and no measures are taken to prevent its spread, as is the case with other infectious diseases, the high infant mortality from this cause is a fortunate circumstance.

RECENT DEVELOPMENTS IN MEDICAL SCIENCE CONCERNING CONGENITAL AND ACQUIRED SYPHILIS.

There is considerable evidence to show that a large number of infants apparently healthy are really infected, and should be *treated* to prevent them suffering with disease later in life. You may ask: How do you know this? There is a blood test called, after its originator, the Wassermann reaction, which enables one by examination of a very small quantity of blood to say whether the syphilitic organism is in the body and active. This reaction disappears with suitable medications which kill the *Spirochaeta pallida*, the infective agent of syphilis. All mothers of congenital syphilitic children give this Wassermann reaction; therefore, not only have we in this reaction a means of ascertaining whether the *apparently* healthy but suspected infant should be treated to prevent it developing serious diseases—very often incurable in later life—but also examination of the blood of the suspect but *apparently* perfectly healthy mother will enable treatment to be applied to her which will lead to the birth of healthy, uninfected children. I could cite many examples of this; also

a case came under my care where diseased or dead children were born and the mother, coming under the care of a doctor, was treated for syphilis for some years, giving birth to healthy children during the treatment. The treatment was then neglected, and children were born who, later in life, developed in one instance blindness, in another paralysis, and in another fits. Had the blood of the mother been periodically examined an indication would have been afforded to continue treatment.

Because the mother asserts "she has never had a day's illness in her life" it cannot be assumed that she had not been infected and she may still have the organism in her body. I have seen many cases of typical congenital syphilis where the mothers make this statement of perfect health; one case in which the mother showed no signs, yet undoubtedly was infected, for her two daughters showed typical signs, and therefore must have had the syphilitic organism in the body; one of these daughters married, and the infant suffered with congenital syphilis. The specific organism was transmitted in this instance to the third generation, a rare occurrence.

I had recently under my care at Charing Cross Hospital two cases of juvenile general paralysis, one with infantilism of the generative organs; the other was blind from optic atrophy; both gave a positive reaction of the blood and the cerebrospinal fluid, which shows that the syphilitic organism had invaded the brain. There were no other signs of syphilis about them. The two mothers when interviewed said they had never suffered in any way, never had a day's illness; both gave a very marked positive reaction of the blood, and this leads me to say that I agree with Neisser that only re-infection indicates the disappearance of the organism from the body. The continuous disappearance of the blood reaction, if it does not indicate certainly the absence of the

spirochæte from the body, certainly points to its not being active. The only certain proof that a person who has had syphilis has been cured—in the sense of absence of the organism from the body—is re-infection. But re-infection of a person who has once had syphilis is very rare. The majority therefore of people who have once had syphilis, whether acquired or congenital, have the organism still in their body; it may be in an active or latent form. If in active form, it is multiplying in the lymph circulation and the chemical toxins that it produces in its growth and multiplication set up characteristic inflammatory changes in the tissues. The administration of mercury and arsenic in various forms and ways stops the active development of the spirochæte, and produces remission of the symptoms; but the organism still remains in a latent form. The blood test shows the commencement of activity of the organism, before the symptoms produced by inflammatory reactions have become sufficiently severe to cause obvious signs and symptoms of disease; periodical examination of the blood is of great value therefore as an indication for treatment.

The discovery of the cause of syphilis in a protozoal organism—the *Spirochæta pallida*; the experimental inoculation of animals; the introduction of new remedies based upon experimental observation by Ehrlich, followed by their application to the human subject; the introduction of the blood test and its wide application as an indication for treatment; and lastly, direct observation of the spirochæte in the brain—affords the proof that the late sequelæ of syphilis, locomotor ataxy and general paralysis of the insane, formerly regarded as parasymphilic, are true syphilitic diseases. These great advances in our knowledge show that medical science is prepared to deal with this problem of national importance. Sir Malcolm Morris, in the *Lancet* of

June 28, pleads for a Royal Commission to be appointed to consider the question of the prevention of syphilis, and he advocates notification. He points out what I have emphasized, that because severe bone disease, skin disease and visceral disease due to syphilis are not so prevalent as formerly, nevertheless syphilis is responsible for an enormous amount of disease insidious in onset and progress, but nevertheless dangerous to the commonweal.

The blood test of all the children in imbecile and idiot asylums has shown that a far larger proportion of these children are congenital syphilitics than was formerly thought.

THE INCIDENCE OF SYPHILIS IN THE POPULATION AND ITS RELATION TO NERVOUS AND MENTAL DISEASE, ESPECIALLY GENERAL PARALYSIS OF THE INSANE.

It is impossible in England to arrive at any definite conclusions regarding the prevalence of syphilitic infection among the population; likewise it is impossible to arrive at any conclusions relating to the frequency of the incidence of disease of the nervous system caused directly or indirectly by syphilis; still the experience of general practitioners, general physicians or nerve specialists, is to the effect that syphilis is by far the most important cause of disease of the nervous system. From an economic public health point of view the importance of the subject cannot be over-estimated; for if the virus attacks the nervous system it is rarely that a complete and permanent cure results even with efficient treatment. Now that we know that general paralysis of the insane is caused by syphilitic infection, the importance of dealing with the problem may appear more urgent to the Government. I have been making investigations regarding the incidence of general

paralysis of the insane in the different parishes in London. This disease forms a large proportion of the male cases admitted to the London County Asylums; although general paralytic men are not very numerous among the male inmates of asylums, yet in about 40 per cent. of the deaths among males the patients have suffered with general paralysis. After admission to the asylums a general paralytic as a rule does not live more than a year or two, generally only months. Other forms of insanity are much less fatal, and so the cases tend to accumulate in the asylums. Not so general paralysis. The death-rate from general paralysis is much higher than the admissions, and yet the male admissions suffering from general paralysis in 1911-12 are 15·6 per cent. of the total cases of certified insanity admitted. It was interesting to observe that West End parishes sent a considerably higher percentage of male general paralytics than East End parishes, although the percentage of females was a little higher from the East End than West End parishes. The highest incidence was St. George's-in-the-West, and the lowest Bethnal Green. The incidence of general paralysis may serve as an index of the incidence of syphilis in the population, and it might therefore be argued that syphilis is more prevalent among males in the West End parishes and slightly more among females in the East End parishes. Although in the upper and middle as in the lower classes general paralysis becomes less and less frequent among females as we rise in the social scale, yet general paralysis in males is as frequent in the upper and middle as in the lower classes, in spite of the fact that treatment is more efficient in the upper and middle classes. The explanation of this may be that the syphilitic organism under the influence of mercurial or arsenical treatment or some other cause has acquired a predilection to attack

the nervous system in a particular way, remaining latent for a number of years and then becoming active when the nervous system is subjected to stress. A certain proportion of people who contract syphilis may be infected with this strain of modified organism. This seems possible from the fact that in countries where syphilis has been recently introduced (Uganda) general paralysis and tabes are hardly ever met with. When the chances of syphilitic infection are equal for the sexes, as they necessarily must be in congenital syphilis, the incidence of general paralysis is equal in the two sexes, consequently we may assume that acquired syphilis among a population bears a ratio to the incidence of general paralysis in the two sexes. It is therefore possible that syphilis is *pro rata* more prevalent among males in West End parishes than East End, and a little more prevalent among women in East End parishes than West End.

THE INCIDENCE OF INFECTION OF THE TWO SEXES IN RELATION TO PREVENTIVE MEASURES.

If we can assume that general paralysis is an index of syphilitic infection of the two sexes, then for every one female infected there are seven males. A considerable proportion of the females infected are prostitutes. No law would be tolerated that did not give equal rights to both sexes whatever their social conditions may be. Males spread the disease as much as females, and any measure that did not prevent males as well as females from infecting healthy people would be unjust. Properly treated in the early stages, the disease yields most satisfactory results, and only a small proportion of cases suffer later with serious disease. But the first duty of the State is to prevent disease; failing that, to cure disease, prolong life, and relieve suffering. Seeing that 15 million people will now be receiving medical

benefits under the Insurance Act, has not the time come for seriously grappling with this foul disease? Is tuberculosis the only disease to be considered? Why! syphilis makes the soil for the seeds of tuberculosis by lowering the vital resistance of all the organs in the body; it is the greatest cause of infant mortality, of diseases of all kinds affecting the nervous system, and the sole cause of the most terrible of all forms of insanity. Why does the Government linger in dealing with this problem of National efficiency, it being just as important as tuberculosis? "It is unpopular" and "must be covered up"; "it does not bring votes" at present. I say *at present*, for when women obtain votes they may demand protection for themselves and their offspring; the political and municipal pillars of society will then be compelled to consider this question from a different standpoint to what they have been accustomed to do.

PREVENTIVE MEASURES WHICH COULD BE UNDERTAKEN BY THE AUTHORITIES.

The disease is preventible, then why not prevented? You may ask: What should be done? I would say, first and foremost: Do not cover up the evil from a false prudery; let it be widely known. Educate the public conscience to the necessity of seriously dealing with the question from a preventive as well as a curative point of view. A fruitful commencement could be made by examining the bloods by the Wassermann test of all suspect mothers and children. All those mothers with a positive reaction, even if *apparently* healthy, could be treated with a view to their bearing living children. All children born of suspect parents, even *apparently* healthy, but who gave a positive reaction, could be treated until the reaction was negative, with a view to the prevention of disease later in life. Government or Municipal

laboratories employed for this purpose would not only thereby perform an important service to public health but prove of great economic value by diminishing greatly the infantile mortality, and the prevention of incurable diseases occurring at all ages. Finally, it is desirable, as suggested by Sir Malcolm Morris, that a Royal Commission be appointed to inquire into the best means to be adopted for the prevention of the spread of syphilis and other venereal diseases.

DISCUSSION.

A MEMBER OF THE CONFERENCE remarked that they required in these things definite information and facts. They must not allow themselves to be actuated by sympathies which had been touched by cases with which they might have come in contact in the course of their work. What he personally wished to get at was how far these diseases were a direct cause of infantile mortality in proportion to many common diseases with which they had to deal. If he could get some definite information on that point he would be very glad to have it.

Dr. A. E. NAISH (Sheffield) said it had been a pleasure to listen to Dr. Mott's interesting and important address on this subject, and he was sure they would all agree with the author in what he said with respect to Government measures for the prevention of this disease. But there was one small point in connection with the frequency of congenital syphilis to which he must take exception. If syphilis were an important cause of infantile mortality the probability was that that mortality occurred very largely in the first month of life. Those cases came very largely under notice of the physicians who ran infant consultations. There had been a question as to how far congenital syphilitic infants showed distinct signs of syphilis, or whether the mere fact of wasting was a sign of congenital syphilis. If a large number died during the first month of life then probably there would be a comparatively large number of infants surviving over the first month of life who would be wasting children—who would be children who did not put on weight according to the normal standard, or who remained stationary over long periods. So it was of importance to test such cases in order to ascertain whether syphilis was largely responsible for the marasmus or wasting which occurred in children during the first year of life. For some

time past he had tested a good many really marasmic infants—infants who failed to respond to the ordinary methods of feeding and general infant care; the kind of infant who remained stationary, in spite of the absence of any vomiting or diarrhoea, or any other sign that was obviously the cause of its wasting; the infant who refused to get on and yet showed no signs of syphilis. He had had them tested fairly largely with this blood test, and he had found that they gave invariably negative results. Every now and again there cropped up a case amongst these infants which showed some definite syphilitic sign and the blood of these children went up to the University just the same as did the blood of the children he had been testing for wasting only, and it was a most striking fact that time after time “negative reaction” was the reply. He thought that the reason why Professor Mott saw so many cases was because he had exceptional opportunities of seeing the particular class of cases in the asylums and other institutions; but he thought that as a rule amongst the ordinary wasting infants syphilis was not so frequent as was supposed.

Dr. RUGH (Philadelphia Pædiatric Society) said he would like to ask if it was Dr. Mott's experience that the Wassermann test was more accurate in childhood than it was in adults. In Philadelphia the question was often raised, and to a certain extent discredit was thrown upon the Wassermann test for syphilis, because it had been generally recognized that the result of the test depended so very much upon the laboratory worker who was making it. He did not know. He did not know from his own experience or from the laboratory whether the test was more accurate in the infantile cases of congenital syphilis than in adult cases. He knew of one case of a youth where there was a suspicion of syphilis, and the Wassermann test was tried by four or five different laboratory workers, and a negative report made in each instance. A short time afterwards the patient died, and a *post-mortem* was made, and the live *Spirochæta pallida* was found in the spinal cord.

Dr. ERIC PRITCHARD (London) said that in reference to the application of the Wassermann test he would like to ask the author whether he could make any suggestion for carrying out the test with greater facility in infants. He had sent up a large number of infants for this test, and quite 30 per cent. were returned by the pathologist without the test having been performed because sufficient blood could not be obtained to perform the test with accuracy. In those cases they sometimes had the Wassermann test performed on the mother and sometimes on the father, but

the latter did not as a rule render themselves willing subjects for the test. He would also like to ask Dr. Naish how he succeeded in getting these tests performed in every case in the face of the fact that he himself found such great difficulty in getting them done. With older children it was difficult, but when it was a case of children in the first month of life it was an exceedingly difficult matter.

Dr. SMITH (York) expressed his satisfaction that Dr. Mott had brought this matter forward after the words which had fallen from Dr. Moore in the previous discussion. He could not agree with what Dr. Moore said, that this subject was not one of very great importance in relation to infant mortality. He believed it was of vital importance, and fancied that syphilis had a great deal more to do with infant mortality, especially in pre-natal life, than they had any idea of. The degree of importance, of course, was a matter on which they wanted more information, and it was to be hoped that methods of medical science would result in there being more definite information before long. Dr. Moore seemed to rely upon the amount of mortality which they obtained from the death returns, but every medical officer of health knew that they did not get anything like true returns. That was a fault of their system of certification of death in this country, which was one of the most anomalous things which existed. The medical man was expected to give a medical certificate for which he received no fee whatever. He was not bound in any way to give an exact statement of the cause of death. Then there was another vital thing—the certificate passed from the doctor to the Registrar by the hands of the relatives. That was a great mistake, and a thing which must be altered. He was going to suggest a resolution to the Committee that they should urge upon the Government an amendment of the law in regard to the certification of death, and that medical men should be expected to give a complete certificate of the cause of death so far as it was possible for them to state it, and that such certificate should be sent in under sealed cover as a confidential document to the Registrar. If that was done then they would be more likely to get the total number of deaths due to syphilis, and of those due to alcoholism. There was a great deal of need for the education of both men and women as regarded this and allied diseases, and a good deal was being done in an erratic kind of way. For some time past many had been discussing the knotty problem of teaching sex hygiene in schools and elsewhere. The education of men and women to respect the sacredness of sex life and the sacredness and glory of motherhood was much needed,

and would have to be greatly promoted in the future if they were to still further reduce infantile mortality.

Dr. HELEN MACMURCHY (Toronto) said that inasmuch as this was a Conference at which the Dominions over Seas were represented she might refer to the recent action of the Canadian Medical Association. She was surprised to find herself differing on any subject from men like Dr. Moore and Dr. Naish, but she did humbly contend that the presumption was that syphilis was a large cause of infant mortality. They did not know whether it was or not, but anyone who had done even a little work in a maternity hospital must remember the long list of records of numerous miscarriages. They had such cases as a woman presenting herself who had been pregnant five times, and there had been no living child. With such cases before them they could not help feeling that the presumption was that this disease was a large cause of mortality, or at least sterility. What she desired to say was that it was a comfort and a relief to find this subject at last in the open air. She could not express the feeling of gratitude which she had to those responsible for the programme of the Conference and to Dr. Mott for what they had just heard. All through one's professional life one felt that there was something which was an imperative duty, and yet one had never been able to lift a finger to do anything. This was a cause of very grievous regret to one who felt that the opportunity might at some time come. She thought the hour was at hand. What happened in the Canadian Medical Association was this: It was the request of the Local Committee that in the programme of the Public Health Section of the Canadian Medical Association a place should be given to the topic of the "Venereal Disease as a Public Health Question"; and they had a discussion which perhaps was the most earnest and most enthusiastic of any of their discussions. Everyone seemed as it were to be glad to have the opportunity of speaking on the subject. They were most indebted perhaps to the physiologists and laboratory men and to Professor R. Harris, who brought the matter first before them. The question was deemed so important that a committee had been formed to report next year as to the steps which should be taken. Something ought to be begun and done now, and she thought it should be done by them. She hoped to have the satisfaction before she went home of seeing the appointment of a Royal Commission, which would be a help not only to Great Britain but to the whole of the Empire and to the English-speaking people all over the world.

Dr. MOTT, in reply, said he felt that many of the remarks which had been made were quite just. With regard to infantile mortality several speakers had practically said, "You have been looking for this, and therefore you have found it, and perhaps you have exaggerated it." He did not think he had exaggerated it at all, and, moreover, with all the leaders of the profession signing a letter pointing out the importance of the subject he did not think they could say it was unimportant or relatively unimportant with regard to the life and efficiency of the nation and with regard to it as a cause of infantile mortality. Dr. Smith anticipated some remarks he was going to have made, and he was very glad he had done so, for with his vast experience as a medical officer of health he could speak with authority with regard to syphilis not appearing in the death returns. All the cases of general paralysis were, of course, never referred to or called syphilis. Owing to the conspiracy of silence on the part of the Press in dealing with this disease it was an important matter that they should get the information from the death returns, for until the mortality came to light they would never be able to prevent the disease. They had much more knowledge of the disease now, and knowing the cause they could hope to treat it. Already they had means of treating the disease in ways which they did not possess even a few years ago, so that the time was ripe in his opinion for a thorough investigation of the existence of the disease in the general population, and also for determining what steps should be taken to prevent it spreading amongst the people, and particularly the innocent women and children. They must not judge altogether the result of syphilis by what came before the eye, and he spoke with authority on that subject. He was perfectly certain of what he was saying, that half the cases of organic diseases of the nervous system were due to syphilis; that a large proportion of the diseases of the heart and blood-vessels were due to it; and that a large proportion of the diseases of other organs were due to syphilis. Another very important matter was this. A little while ago it was stated that there was hardly a case in their lunatic asylums of imbecility due to syphilis. Now there were tests which showed that a much larger proportion of the imbeciles there were there owing to congenital syphilis, although they showed no signs of it on the body. In Victoria, where the subject had received a great deal of attention and had been taken up by political unions in a way which was most creditable, they found that the test had shown a large proportion of syphilis which was unsuspected, in institutions and amongst the

population, and they had advocated measures to be taken to investigate, and to prevent, and that was also the case in Canada. He was very pleased indeed to hear the able speech of Dr. MacMurchy on the subject, and it showed that their Colonies at any rate were showing them the way on this subject. With regard to the question asked in respect of the Wassermann reaction. Of course he had not done it on many children, but it seemed to be thought that people would object to the test being done. He could hardly believe that. He had had women come to him and ask to have the test done on themselves and their children when their husband had been ill with general paralysis in an asylum. They had said, "We know what the cause of the disease is; can you tell us whether we or our children are going to suffer from it?" They had been sent to the hospital and tests made. Very often it was found the children were infected, and that meant that the mother had been infected. If they knew that they could treat them. He asked if that was not rational. There was a very able man, Professor Dean, of Sheffield, who was interested with him in that subject, and they applied to the Metropolitan Asylums Board to be permitted to make an investigation of all the children in the asylums who it was suspected might suffer from the disease, in order that if there were other members of the family they might be allowed to warn them and give the necessary information. They were told that it could not be done because the friends might object. To show how absurd that was, just at that time he had two children in the hospital suffering from general paralysis. He said to the mothers, "Have you ever been ill?" and the answer was that they had never had a day's illness in their lives, but they had had miscarriages and abortions. He asked them if they minded his testing their blood and that of their children, and they agreed willingly. Although many years had elapsed he found a marked reaction. That was to say, they were infected although they knew nothing about it. He could easily multiply such cases. He quite recognized what Dr. Pritchard had said as to the difficulty of getting the blood of very young children, and the plan they adopted was usually aspiration, which did not give much pain; and even quite young infants could be tested in that way. With regard to the method of the test and its usefulness he could speak specially in relation to the disease of general paralysis because they had so many cases. There they were able to diagnose the disease in 98 per cent. of cases by the blood, and often and often they had been able to say that a man had got general paralysis from the test

when the medical authorities had thought he might be discharged. So it was of very great value at any rate in that disease. They, however, always used the original Wassermann reaction, and a great many discrepancies which arose in different laboratories were due to different methods of procedure. He did not mean to say that the case Dr. Rugh referred to was not tested by the proper methods, because he knew that in Philadelphia they had most eminent pathologists, but if the boy had been treated quite recently it was quite possible the reaction would not come off. Sometimes when they expected a case to give the reaction it did not. As a test he considered it was of the very greatest value, although he did not claim that it was infallible.

Dr. NAISH said he had been asked by Dr. Pritchard how he managed to get so many tests of small infants by the Wassermann test. It was very difficult, but he always took the blood himself, and it meant searching all over the body for a vein. He believed he failed once in every six or seven times. With regard to the technique of the Wassermann test which had been done for him it was done by Professor Dean, whom Dr. Mott had mentioned, and who, he believed, was one of the first authorities on Wassermann reaction in England.

FOURTH AND FINAL SESSION, AUGUST 5.

THE WORKING OF THE MATERNITY BENEFIT UNDER THE NATIONAL HEALTH INSURANCE ACT.

BY BARBARA SUTHERLAND, M.A., M.B.

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Submitted by Dr. A. K. Chalmers.

THE following details are gathered mainly from information obtained by the health visitors of the Glasgow Public Health Department. The cases visited are, naturally, those which are considered most in need of direction and guidance, and any

information as to how the receiving of the maternity benefit under the Insurance Act affects the welfare of the mothers and infants concerned is especially interesting.

The choice of cases for visiting depends on the Notification of Births Act. All cases notified by midwives, or institution nurses acting as district midwives, are first visited by the female sanitary inspectors. "First Visit" cards are then filled, and from the information entered on these a decision is made as to the need of subsequent visiting by one of the official health visitors, who are nurses with midwifery and general training.

Effect of Act on Notifications.—Since the maternity benefit came into force in January there has been a marked difference in the notifications of births—viz., a decrease of notifications by the Maternity Hospital staff, and a corresponding increase in notifications by doctors in private practice and by midwives. Many "handy-women" and midwives in past days have apparently returned to their old duties after some years of comparative leisure, and naturally, serious evils are expected to result; but, up to the present time, we have not been able to prove that there has been any disastrous effect by this. In many cases, too, midwives are so anxious to secure more cases than formerly, now that the prospect of their payment is comparatively secure, that they cease attending about the sixth or seventh day of the puerperium and pass on to new cases.

The marked decrease in the number of cases attended by the Maternity Hospital nurses is difficult to explain wholly, as the hospital staff has always been instructed to ask donations from patients attended, and at no time is attendance refused on the ground that the person is able to pay for other attendance. At present, the hospital authorities try to visit (in so far as compulsion lies within their province) on a

payment of 10s. in normal cases and 15s. in abnormal cases, when maternity benefit is received.

Our Numbers.—The working of the maternity benefit has been, on the whole, very satisfactory, and although regularly cases are brought to our notice in which benefit probably should have been received but has not, still it has been difficult to obtain any evidence of direct negligence.

In the investigation of the cases now to be shortly considered the tendency often has been to call a halt, and to say that there are no defects or hardships connected with the maternity benefit scheme; but our numbers show that there are persons, even if few, who are not included in the list of recipients, either by reason of non-insurance or default, though their needs are great. These cases are well worth recording.

In all, 2,552 cases were investigated by our department; of these 2,145 received maternity benefit and, together with the 214 cases in which no information was received, need not be considered further at present. The remaining 193 merit further attention, for in 56 cases one parent was insured, although no benefit was received, while in 137 cases neither parent was insured.

Insured: Maternity benefit received	...	2,145
" " not received		56
Not insured	... ..	137
No information	... ..	214
		<hr/>
Total		2,552

Let us first consider the 56 cases in which, though one parent was insured, no benefit was received. In 16 of these cases, no further information was available beyond the fact that two of the births were illegitimate. In 32 cases the insured person was in arrears with payment, generally owing to periods of unemployment

and inability to pay the employer's contribution during such times. Frequently it has happened that the person offers to pay arrears when claiming maternity benefit in the belief that sickness and maternity benefit are on an equal footing with regard to payment of contributions in arrears; but in the case of maternity benefit the necessary number of contributions must have been paid before the child is born and the claim for benefit not made until after the birth, so that it is impossible to have arrears at the time of claiming.

Eight cases still remain. Three of these insured persons were deposit contributors, who had not been insured for the necessary length of time, while 2 were voluntary contributors not yet insured for fifty-two weeks. In 2 more cases the insured persons, one of them an unmarried woman, did not claim benefit, and in the final case the insurance card and book had been lost, and no effort made to replace them, as the name of the Society was forgotten. The insured person in this case was a mentally defective unmarried woman.

The following is the summary of the above 56 cases, where at least one parent was insured and no benefit received :—

In arrears with payment	...	...	...	...	32
Deposit contributors, not insured for 26 weeks	...	...	...	...	3
Voluntary	..	52	..	...	2
Benefit not claimed	...	...	...	...	2
Card and book lost, Society unknown	...	...	...	...	1
No information	...	...	...	...	16

56

In turning next to the larger class of 137 cases where neither parent was insured, the most striking point is that, in the majority of cases, there seems to be no adequate reason why the persons should not

have been insured. In 46 of these cases the mothers were unmarried women, and although some of them acted as housekeepers for their immediate relatives and were so not insured, many worked as charwomen and apparently should have come within the powers of the Act. In a few cases the mothers lived as the wives of insured men, but, as there was no legal tie, maternity benefit could not be claimed.

In 33 cases of non-insurance the husband described himself as his "own master"; many of these men were small shopkeepers, whose wives might have benefited greatly by the receipt of maternity benefit had they come within the scheme.

In 9 cases the parents were foreigners, and it was difficult to ascertain why they were not insured. Among the list of non-insured husbands were 7 policemen, 4 post office employees, and 2 corporation employees, all presumably insured in a special scheme, which did not include the payment of maternity benefit. Seven parents earned their livelihood as hawkers and remained outside the scope of the Act; in 5 cases the father was dead, and the mother not herself insured, while in 6 the husband was abroad. In 2 cases the father was unemployed owing to illness, and in 2 others the husbands were soldiers, who were not insured. One husband was in prison, while one was a casual worker who had deserted his wife. The occupations of the remaining 12 were as follows: Cattle-drover, music-hall artist, spindle maker, chemist, watchman, traveller, coach-painter, grinder, labourer, steel-worker, coat-maker, and picture-framer.

Obviously most of these persons should have been compulsorily insured, and it is difficult to understand how they managed to escape the ever-watchful Insurance Inspector. Even if insurance were not necessary in some of the cases, yet with the benefit scheme working well in thousands of other cases,

surely it is at least desirable that these few should have been included.

The summary of the above-mentioned 137 non-insured is as follows :—

Illegitimate	46	Cattle-drover	1
"Own Master"	33	Music-hall artist	1
Foreigners	9	Spindle-maker	1
Policemen	7	Chemist	1
Hawkers	7	Watchman	1
Husband abroad	6	Traveller	1
„ dead	5	Coach-painter	1
Post Office employees	4	Grinder	1
Husband ill and un-		Labourer	1
employed	2	Steel-worker	1
Soldiers	2	Coat-maker	1
Corporation employees	2	Picture framer	1
Husband in prison	1		—
„ in desertion	1		
		Total	137

One special case is worthy of mention here. A woman who had been an employed contributor married a non-insured man and continued as a voluntary contributor; before she had been insured for fifty-two weeks she gave birth to a child, and so received no maternity benefit; whereas, had she still continued as an employed contributor, though unmarried, she would have been entitled both to maternity benefit and sickness benefit, as she had already paid more than twenty-six contributions.

In many of our cases both parents were insured, and, while the husband's Society paid the maternity benefit, the woman's Society paid sickness benefit for two weeks preceding and two weeks following confinement, so that the total amount received for one normal confinement amounted to 60s.

Payment of Benefit.—So far as our information goes maternity benefit is almost always paid as money to the husband in cases where he is insured. In very few cases the Insurance Society has retained

part of the benefit to make direct payment either to midwife or maternity hospital. The hospital now makes use of a fixed form of agreement with the insured person, viz.: "The insured person and maternity and women's hospital are agreed that a sum of shall be retained by the Society from the maternity benefit, for which this certificate is to be used, and paid to the hospital"; but, notwithstanding this agreement, some Societies refuse to deduct the fee or donation, as it is called, from the sum paid to the insured person. At least one Insurance Society pays only 15s. immediately after the confinement, retaining 15s. for fourteen days lest any emergency should arise within that time; while another Society sends its agents to the homes to pay maternity benefit at an hour when both parents are usually present.

In some cases where the woman makes direct application, and explains to the Society officials that the husband will certainly abuse the benefit, the money is paid to her when she applies. Payment of benefit "in kind" is quite unknown, beyond the occasional payment of midwives' or hospital fees above mentioned.

One notable effect of the passing of the Act is the raising of midwives' fees, usually from 10s. to 12s. 6d., whether the person attended be insured or not. This is a decided hardship in cases where benefit has not been received, or where received is less than the fee, as is often the case with the deposit contributor.

In a circular addressed to Societies dated January 9, 1913, regarding sickness and maternity benefit, (by the National Health Insurance Commission [Scotland]), it is stated that "there is only one case in which the maternity benefit is less than 30s., that is, in the case of aliens."

Fortunately, this refers to Society contributors

only, for otherwise one might ask: What of the deposit contributors? The case of the deposit contributors is often very pitiful, for while benefit often amounts to a few shillings only, the midwife's fee at the advanced rate is demanded. Typical sums received by the contributor as maternity benefit are 7s. 6d., 8s. 9d., and 11s. 8d. Happily, there is evidence of dissatisfaction among the deposit contributors, and many of them are now resolved to transfer to approved societies.

Delay in Payment.—The interval between confinement and payment of benefit varies from about three to fourteen days normally, although many cases occur in which payment is delayed for four or five weeks. The most common cause of delay is the ignorance of the insured person, accompanied by a vague dread of signing a schedule. Earlier in the year it was very noticeable that Society employees made no effort to help these people in their difficulties, and sometimes even deliberately neglected their duties toward them. One instance is worth quoting now. An insured woman gave birth to an illegitimate child. When she applied for maternity benefit she was told that she was in arrears with her weekly payments and was not entitled to benefit. Upon investigation, it was found that the entry of payment had been wrongly made by the insurance agent in her insurance book, and that in consequence of this she had not known of the arrears in contributions. Shortly before this time the agent had been dismissed from his employment, and the Society would accept no responsibility in the matter.

Any delay in payment almost invariably leads to misapplication of the benefit, as the necessities of the actual confinement have had to be obtained otherwise, if obtained at all.

The commonest misapplication is found in the payment by the mother of arrears in rent and of

small debts, which have often accumulated immediately before the confinement. While these cannot justly be considered as instances of abuse of the benefit, yet it cannot be said that the benefit has been rightly used, as the maintenance and care of the woman during her confinement is supposed to be the essential use of the benefit.

Abuse.—Abuse of the benefit money is, unhappily, very common. Cases are numerous in which the husband receives the entire 30s. and spends it in liquor, while in many cases the receipt of benefit has resulted in one or two weeks of unemployment for the husband. Sometimes, in anticipation of the benefit, the man stops work and has been known to refuse work when offered it.

Some men have devised an ingenious method of evading the accusation of not giving the benefit money to the mother—they hand over the 30s. when it is received, but deduct that amount from the usual money given for household expenses. Mothers have sometimes said that they were better cared for at previous confinements when there was no maternity benefit, as the receiving of 30s. by the husband is often sufficient to disturb the peace of an entire family.

In some instances the husband has used the 30s. in payment of debts incurred in his betting transactions. One man spent the maternity benefit in the purchase of a gramophone! Still worse are the cases where the wife joins with the husband in squandering the sum on drink, for the effect on the household is then disastrous. A few such cases have been discovered by us, where young children have been left at home in a state of filth and misery, while the parents, having the infant usually with them, pursue their course of enjoyment outside. At least two of the cases were so bad that they were reported to the Society for the Prevention of Cruelty to Children,

so that the parents might be cautioned and prosecuted if necessary. They are still under observation by the officers of that Society.

It is obvious from the above statements that, in many cases, abuse of the money would be prevented by the direct payment of maternity benefit to the wife and not to the husband, while misapplication could likewise be avoided by payment of the money before confinement. The term "confinement" is defined for the purposes of the Act as "labour resulting in the issue of a living child, or labour after twenty-eight weeks of pregnancy resulting in the issue of a child whether alive or dead." Thus, if a woman who is insured, or is the wife of an insured man, reaches the twenty-ninth week of pregnancy, she is, under ordinary circumstances, certain to receive benefit some time after confinement. If, however, benefit could be received some time after the twenty-eighth week were passed and before the birth, it is evident that it would be much easier to make "adequate provision" for the maintenance and care of the woman during her confinement.

Where the insured person is a Society contributor, an arrangement might be made whereby the woman would have to notify the Society of the expected confinement some time beforehand. If some such arrangement were made, it should then become easier to control the evils which arise from lack of skilled attendance by midwife or doctor during the weeks immediately preceding labour.

In conclusion, it is well to point out what we have found to be the special defects in the administration of maternity benefit:—

- (1) There are persons not included who should be.
- (2) Benefit is paid to the husband where he is insured.
- (3) Delay in payment is common.

DISCUSSION.

Dr. SALEEBY said he believed there was no subject before the Conference of more urgency and importance than this and there was no object they could be of more use in respect of at the moment, because, as they knew, the Insurance Act Amendment Bill was now before the House of Commons and the particular clause which dealt with the administration of the maternal benefit would come up for discussion either that day or the next. As they knew, on the Committee stage of the Bill it was decided that the money should be paid to the mother, but it was highly possible that that decision would be reversed by the whole House unless the most strenuous efforts were made in support of it. The gentlemen of the Press would perform a great service if they would give publicity to the opinion of the Conference and the resolution which he hoped they would pass in forcible terms. The circumstances were these. The men and their representatives in the House of Commons—because the men only were represented in the House (and there never was such a good opportunity in favour of a particular proposal)—were going to fight against the mothers receiving the money. The High Court of the Ancient Order of Foresters opened in Manchester the previous day and the High Chief Ranger presided over an attendance of more than eight hundred delegates. He read in *The Times* that, on the motion of Mr. Marlow (London), the Parliamentary agent of the Order, a resolution was passed protesting against the action of the House of Commons Standing Committee on the Insurance Act Amendment Bill in preventing the husband from drawing the maternity benefit as an unwarrantable interference with domestic life. The resolution affirmed that the suggestion that the money might be viciously expended by the husband was an insulting reflection upon the moral character of the working classes, and supported the amendment on the subject put forward by Mr. Roberts and Mr. Bowerman. Sir John Randles, M.P., and Mr. Needham, M.P. (who, with others, had welcomed the delegates), said that they would lay the opinion expressed at that meeting before the House of Commons. He would say that the chances were pretty high that that opinion would carry considerable weight in the House of Commons, and it was for them to deliver a counter-stroke if possible. It was stated by Mr. Masterman that there were but few cases where the maternity benefit had been abused, but he (the speaker) believed that there were as many instances as he chose to look for. He held in his hands a list prepared by

the Women's Co-operative Guild and he had counted between sixty and seventy cases of gross abuse from all parts of the country. He had also with him a typewritten supplementary list and from what he read there could be no doubt that it was a public scandal of the first order that the nation's money should be expended in the manner it was. One of the cases recorded was that of a man who, having been paid the money under the maternity benefit, went and lived with another woman. Plenty of cases had been reported such as that, which was the foulest of all conceivable abuses of the benefit. They intended that the money should be paid over to her whose money and whose child's money it was, and they would be neglecting their duty unless they struck a blow for the women who were not represented in the House of Commons and against whom very considerable pressure was being brought, as, for instance, by the Order of Foresters, who said it was an insult to the husbands. It was the fact that the maternity benefit had been very much abused and Dr. Sutherland had added other instances to the lists which he held in his hands. If time permitted he would have read the whole list, but he could only say that there was every conceivable kind of improper use and abuse of the maternity benefit which was directly for the mother and the child. It would be infinitely better for both if there had been no maternity benefit. He was strongly of opinion, however, that the motion to be proposed by Mr. Robertson, and voted for by the representatives of the men, would be passed. They had good evidence that this maternity benefit was said to be regarded as a benefit for the husbands—the most idiotic thing ever enacted in Parliament. They had good evidence that over and over again it had been nothing else but a publican's benefit and it was high time that they should express a strong opinion that this should be stopped.

Miss BONDFIELD (Women's Co-operative Guild) said she was very glad to be able to endorse the paper read. She wanted that very important gathering to thoroughly understand the strength and support behind the resolution which would be submitted by the Executive Committee. When the Bill was first drafted and introduced into the House of Commons, the Women's Co-operative Guild said the maternity benefit should be the mother's benefit. At the Foresters' Conference it was stated that the Standing Committee's decision was the result of the influence of a little group of women who lived in London, but she wished to tell them that it was the spontaneous opinion of the working mothers of the country two years ago. There was no one

in the country who understood this problem better than the 30,000 women organized in the Women's Co-operative Guild. They were mothers who had had training in domestic work and mothers who had run their own houses on a miserably inadequate wage. They had not only the support of the Guild, but they had the support of all those decent workmen who were in touch with the work the Guild was doing and who knew that by far the best person to organize the spending of the maternity benefit was the mother herself. They admitted with regret that there were exceptions. They regretted that there were women who could not be trusted with money. They knew such women did exist, but this was the point which appealed to them so strongly. The women of the Guild said, "We are beginning a new era of social service, focussing itself around the health department of our towns; as the medical officer of health becomes more imbued with the spirit of preserving the health of the town and in working for the good of the race, so we shall bring agencies to bear upon the mothers through schools for mothers, milk depôts, health visitors, better-trained midwives, and an increased number of midwives. The whole ramifications of the health service will come to the support of the mother and help to educate her to a higher standard of motherhood, whereas none of these agencies touch the father in any way whatever. And so we feel that we can face the responsibility of having certain cases of abuse if the benefit becomes the mother's benefit, because we know we have this great auxiliary force which will help us to reach those mothers and strengthen them against their weaknesses." Therefore she said there was no ground for the opposition to the proposal which the Guild had pressed upon the House of Commons. From the very first they recommended it, and throughout the whole experience in which the Guild's women had taken a very practical part on Insurance Committees and otherwise they had tried to press the proposal forward, and had said that until this was the mother's benefit they would find these grave cases of abuse continually occurring. What were the objections? It was said that they must protect society from fraud, and it was asked how they were to know that the benefit really reached the mother's hands unless it was put into the hands of the husband, but they knew there was not the slightest guarantee in a large number of cases that it would reach the mother's hands when placed in the hands of the husband. Then it was said that if the husband had the money it safeguarded the wife against the drinking cronies who clambered up the stair-

case, but they had far more agencies to cope with the drinking cronies on the staircase than the drinking cronies of the husband in the public-house. Then it was said that in law the husband was liable for the expenses and that the husband should have the 30s. because he was liable for the expenses of the confinement, but her contention was that in so far as it was made the wife's property the husband would be protected to the extent of the 30s. by the provisions of the Married Women's Property Act, which made the wife responsible for her property to the extent to which it could cover the amount. In the matter of this maternity benefit there was a distinct and specific purpose for which it was to be spent, and they protested against the idea that the 30s. was sufficient for the complete expenses connected with the confinement throughout. As they knew, the midwife was under an obligation to call in the doctor in serious cases, and the doctor's fee alone very frequently amounted to a guinea, and even in some cases more. The vital purpose for which the maternity benefit was needed was to obtain more nourishment for the mother, and medical and nursing skill, but they knew that 30s. would not pay for all the extra nourishment she needed and the extra help in the house; and the husband would still have a certain amount of liability for additional expenses during the period of confinement. What was the practice of the average working class husband? The husband gave the wife so much money out of his wages. If he was a decent man he would probably give the wife all the wages he earned except 1s. or 1s. 6d. for tobacco money. She was speaking of the men earning 30s. and below a week. Both the husband and the wife knew that they needed every penny in order to meet the rent and the family requirements. When the confinement came that was extra expense, but the wages did not go up to meet the confinement. To meet the expenses of the midwife the woman managed to save 1s. or 1s. 6d. a week out of the housekeeping money. When the 30s. maternity benefit was given, the woman got it into her head that it was to be her money and that she need not make provision. And she was quite right too. If, however, the money did not come to hand she was in a worse position financially than under the old arrangement, when she knew she had to look forward and save the expenses. She appealed to that gathering when they had the resolution before them that it should be passed unanimously, in the knowledge that they would be performing a great social service to raise the status of motherhood and improve the physical health of the community.

Lady MEYER (St. Pancras School for Mothers) said she would like in a very few words to associate herself warmly with what had been said, and urge upon that assembly to pass unanimously the resolution which was going to be submitted to them, in view of the very important fact that the measure was before the House of Commons that afternoon. They had had before them so very logically and clearly the issues on which they had to fight, that she thought it was not for her to push the matter any further, but she would just like to give an illustration of the way in which this maternity benefit went astray amongst the working classes. In St. Pancras, where they did a great deal of work in their school for mothers, their workers had told them that time after time in speaking to the husband on this subject he would comment upon it as "I have got my maternity benefit to look forward to." That only showed how in the short time that this new legislation had been at work already the fashion had grown up of regarding it as the husband's benefit. They could not afford to allow this custom and this fashion to creep in. The other illustration she would give was just an anecdote as to how she had known the money to be spent by a good husband and not a bad one, who was not a drunkard or a great smoker, but who erred from want of knowledge of the objects of the maternity benefit. On his way home with the maternity benefit he met a sailor friend, who, as sailors often did, had brought from a voyage abroad a number of odd things which he did not require, and he offered the man a shawl. The man paid 8s. for it, and the rest of the money he spent on buying a pair of trousers for himself, and a black hat and feather, and these things he took home and laid on the bed with pride, and said, "And here is 5s. over for your mother for looking after you and doing the washing." Anyone who had anything to do with poor women in their confinements knew that one of the ways in which the money should be spent was in paying a woman to do the very hard work of the washing, which was extra at such a time, so as to save the mother from being obliged to stand up and work after her confinement. Those two examples might enable people who did not know as much about the subject as many in that room did to see that even a good husband who wished to give his wife great pleasure allowed the money to go astray instead of using it for its legitimate purposes. She hoped they would not have any dissentient voices in the passing of the resolution, and in urging upon the House of Commons, which, as Dr. Saleeby had said, represented men and not women, to do this justice

to women, and not allow themselves to be carried away by the false plea that it was a slur on the husband when the woman was paid the money which was justly hers.

Miss HELEN G. KLAASSEN (Camberwell School for Mothers) said she was going to look at the question from the point of view of the Foresters. She rather sympathized with them, because she thought the whole matter had been put upon the basis of the bad men they, as workers, came across. She had a considerable amount of sympathy with the Foresters, and she would like to put the whole matter on quite a different basis, and that was the basis of custom. She would say that it had been the custom in the first place for the women to put by a certain amount of the weekly money until the time came for spending it, so that in the past it was likely that the men had little knowledge of the expense of confinements. She thought that, apart from any question of insult to the husband, it was a perfectly right basis to pay the money to the woman. By paying it to the man they were really introducing something quite new and contrary to custom. The fact that in the past the woman had always put it by and had spent it made the woman the proper person to administer it now. Looking at it from the point of view of the men, they must not think that there were only bad men and no bad women in the world. She knew at least one case where a woman might have taken her marriage certificate and received the benefit, and she would have been receiving it for the benefit of another man's child. She thought in the rules which were being made in these new regulations such matters as that should be guarded against. The man belonged to a society and was known by the society, but the woman who applied for the benefit which her husband had paid for was not known to the society previously, and that did introduce a real difficulty in administration which must be guarded against in some way. Again there was the case of the drunkard. All social workers knew of men who gave their wives an allowance for house-keeping and perhaps paid the rent themselves, and who did not allow their wives to have the handling of a penny more than they could actually help. They knew cases where this was done very wrongly, but they also knew of cases where it was done very rightly, and where the woman would spoil the whole house if she had the spending of the money. She believed it was the view of all legislators that to legislate for the abnormal was always a bad thing—in general legislation they should never be guided in their rulings by very abnormal cases.

Mr. A. D. D. BANKS (Ashford Urban District Council)

said he rose with a good deal of pleasure to add his testimony to the value of the resolution that he hoped would be passed at the subsequent meeting. He represented on the Ashford Urban District Council the whole body of the workmen of the district. Ashford was a railway centre, and they had a good deal to do with the administration of the benefits under the Insurance Act. He represented the Oddfellows Society, and he had associations with all the Friendly Societies, and there they were thoroughly of opinion that the maternity benefit under the Insurance Act should be given to the mother and child. He was confident that the Oddfellows at Ashford would be disgusted at the resolution passed by the Ancient Order of Foresters. They in Ashford as working men did not consider it an insult to hand over the money to the mother, and indeed they found in connection with the work at Ashford that it was often the mother who took practically all the wages, and saw to it that "father's club" was paid; she kept it by until the club night came, and consequently it was the woman who managed the financial affairs and who had become somewhat interested in having the benefit conferred on her when the time came. He knew of an instance where the other day a sick visitor from the club took the maternity benefit to one of the member's homes, and the man was at home. The visitor said, "Here is your benefit," and the husband replied, "Lord bless you, the woman must have that; take it to mother." He believed the vast majority of the working men of the country would be glad if it could be made impossible for men to have it to deal with at all. They would rather that the woman had it. They had working men who were not fitted to be trusted with sixpence, and they had women who were not fitted to be trusted with sixpence, but he believed the vast majority of working men in this country intended honestly towards their wives, and when this maternity benefit for which they were subscribing was due they were only too glad that it should be handed over to the person concerned without any restrictions. He hoped that the Conference would pass with no uncertain voice a resolution contrary to that passed by the Foresters, and so show that it did not believe the payment of the benefit to the mother would be one of stigma on the working men. The workmen of the country he was certain would say that it was not an insult, but that on the contrary it was reposing a trust in their honesty and their right dealing with those who needed all the help they could get in their time of trial.

Mrs. ROGER GREEN (Burton-on-Trent Health Society) said one thing they had to consider was that the

legal redress for the bad spending of the maternity benefit actually had to be taken by the mother herself in the home against her husband. As one who went in and out of the homes of the working people she would like to ask whether what they were proposing was worth while. What sort of trouble was it going to cause? Where did the money come from which kept the home going? Was that not why they heard so little about complaints, because it was obvious that there were a good many people in the country who did not do their duty? It was said that the husband paid, and that was a very sound argument. They must not forget the fact that at the Foresters' Conference those present were delegates who represented opinions of all the local organizations, and the opinion expressed was no doubt that of thousands of people. She was a member of an Insurance Committee, and as they knew there was always talk about two-tenths for this, and so much by the State, and so much from one source and so much from the other. There was plenty of money which by some alteration and readjustment could be easily paid to the mother directly from the State, and then the husband could not complain. Had they ever realized what it meant to be a woman and not have a penny to call her own, and to do all the work of the house and all the weekly washing? The woman looked after the baby and did all the work of the home, and for all the accumulation of years of work she had not one penny she could call her own. She felt that the first benefit which the woman was entitled to call her own should be the maternity benefit. If it was thought that it was not equitable that the men should pay the money and then hand it over to the woman, then let them set their backs to the wall and say that it should come straight from the country.

TOXÆMIAS OF PREGNANCY AND THEIR EFFECT UPON MATERNAL AND • INFANTILE MORTALITY.

With Suggestions as to how the Association and the Public Health Department might assist Obstetricians in lessening the Death-rate from these and other complications of Pregnancy and Parturition.

By J. M. MUNRO KERR, M.D.

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My first duty, and a very pleasing one, is to thank the Committee of the National Association for the Prevention of Infant Mortality, and for the Welfare of Infancy for the honour they have done me in inviting me to read a paper before this Conference of the Association.

I am particularly delighted to be invited because it brings me into association with many who have done so much to lessen infantile mortality and gives me an opportunity of indicating some further advances we might make. For, unfortunately, there is no rest for those who elect to serve under the banner of progress; they must ever march onwards and extend their field of operations.

Now I believe the time has come when those of us who are particularly interested in the welfare of the new-born must direct our attention, not only to the infant, but must look after and care for the expectant mother during her pregnancy.

As the time at my disposal is limited, I shall make no further remarks by way of an introduction, but shall at once proceed to the matter upon which I have been asked to address you.

The subject, as you see, is a very definite one—

“Toxæmias of Pregnancy and their Effects upon Maternal and Infantile Mortality.” For the benefit of those who do not belong to the medical profession let me explain what is meant by the “toxæmias of pregnancy.” The toxæmias of pregnancy may be described as a group of complications which arise during pregnancy, especially a first pregnancy, and which are due to disturbed metabolism and an accumulation of waste material in the system of the pregnant woman.

They manifest themselves in many different ways, but I propose to consider only two which are at present admitted by all to be of toxæmic origin. As regards the others there is still sometimes uncertainty in particular cases as to how far they are genuine examples of toxæmia. The two examples I take are : (1) eclampsia ; (2) albuminuria. But not only am I going to limit myself to these two examples of toxæmia, but I am going to limit myself to these diseases as I have seen them in the Indoor Department of the Glasgow Maternity Hospital. And I do this because we have in the hospital exact records of all these cases, so that I can speak of them with a feeling of certainty that they were all examples of toxæmia.

Now let us consider the maternal and infantile death-rates in these two complications.

(1) *Eclampsia (Puerperal Convulsions)*. — You will observe from the tables that during the years 1901-10 inclusive there were 293 cases of eclampsia. Of these 293 cases eighty-eight mothers died—a maternal death-rate of 30 per cent. As regards the children 208 were born dead or died, an infantile mortality of 70 per cent. But that is not all. Several of the mothers developed chronic Bright's disease ; and even amongst the children who lived several died shortly after birth, and many were premature, poorly nourished, and started life very much

handicapped. As evidence of this you observe that the average weight of the children was only $5\frac{3}{4}$ lb.

Distressing as it is to contemplate such a death-roll—and remember it is the death-roll of the indoor department of one hospital—it is far more distressing to know that this terrible complication of pregnancy is a preventible disease. If these women had been properly looked after during pregnancy hardly any of them would have died, and only a very few children would have succumbed. Amongst women of the wealthy class, who are looked after during pregnancy by specialists or careful family practitioners, eclampsia is very rare, and especially rare in its graver forms.

(2) *Albuminuria*.—But I can illustrate this best by considering the other toxæmia of pregnancy, albuminuria. Now albuminuria (albumen in the urine) is almost always present before the eclamptic seizure. It is, of course, only a symptom, but in most cases it may be safely referred to as an early stage of the toxæmia which at a more advanced stage is associated with eclamptic convulsions. If you look at the figures for albuminuria you will at once be struck by the fact that both the maternal mortality and the infantile mortality are very much lower. During the same ten years, 1901-10, we had 121 cases of albuminuria. Amongst these cases there was a maternal mortality of 7 or 5·8 per cent., and an infantile mortality of 33 or 27·2 per cent.

Now what does this prove? It proves that if the pregnant women were treated while they have albuminuria, and especially if they were treated early, we obstetricians could save a great number of maternal and infantile lives. And mark you, we could save for the State the most valuable mothers, the young mothers who, if saved, could produce numbers of healthy children.

It is quite unnecessary to labour this point and quite unnecessary to give more statistics. Every

medical man knows that if pregnant women in the poorer classes were looked after properly an enormous number of maternal and infantile lives might be saved from the dangers of toxæmia and other complications of pregnancy. Many of these complications I might refer to, such as malpositions of the child, hæmorrhages, tumours, malformations of the parturient or birth canal, all of which, if recognized early in pregnancy or early in labour, would result in an enormous saving of maternal and infantile lives.

It must not be imagined we are doing nothing for such cases. As a matter of fact we do everything we can to encourage prospective mothers to consult us at our maternity hospitals, but except when the complications have become specially serious we seldom see these women.

If we admit, and every one must admit it who knows anything about the matter, that a great number of mothers and infants are lost who need not have perished, the question naturally arises, who is to remedy this and how is it to be done?

As regards those who are to be made responsible for bringing about a more satisfactory state of affairs, I can readily understand you members of this Association and the Public Health Authorities saying that this matter of the care of pregnant women—the prospective mothers—does not belong to your spheres of influence; that it is a matter that concerns us obstetricians, and that we should take it up and deal with it. Now I entirely disagree with such a view. Unless the Public Health Department comes to our aid, we can accomplish very little. As illustrating how little can be done in connection with preventive medicine, unless the Public Health Authorities take it up, let me mention two problems which might very naturally be considered as belonging to the province of obstetrics, but which were only satisfactorily dealt with when the Public Health Department

were permitted to deal with them. I refer to infantile mortality and ophthalmia neonatorum. A great deal has yet to be done in connection with these two problems, but now that the Public Health Department has authority to deal with them, we know that they will gradually be solved just as we see other problems are being gradually solved by them. But you may say to us obstetricians, you should educate the young mothers; you should tell them about the dangers they are liable to if they are not properly looked after during pregnancy and parturition; you should print leaflets and circulate them; you should organize mothers' meetings and tell them what should be done and when they should seek advice. Now I ask you who are concerned with infantile mortality, and you who are connected with the Public Health Department of the State, if you have ever found much benefit result from the circulation of leaflets? Undoubtedly they advertise the subject and the State is educated up to dealing with the matters contained in these leaflets, but until the Public Health Department obtains authority to step in and deal with the particular problems very little advance is made. Take the infectious fevers, tuberculosis, ophthalmia neonatorum; was there any appreciable progress made in dealing with these matters until notifications of these diseases was made compulsory?

We must have your help. We obstetricians must have the assistance of those organizations which are concerned with infantile mortality, and above all we must have the assistance of the Public Health Authorities.

I have shown that there is a great number of mothers and children lost, and that there is a great number of mothers permanently injured and children born handicapped as regards health, as a result of the complications of pregnancy and parturition. I have also indicated, and I trust convinced many, that this

can only be remedied by an association such as yours, and by the Public Health Department coming to our aid.

But when one comes to consider the remedy for the existing unsatisfactory conditions, there must be great differences of opinion. To-day I can only give my own views on the matter. I advance my views with a certain amount of diffidence, for the problem is a difficult one, and the proposals I am about to make will, I feel certain, meet with much adverse criticism.

Well, without further delay, let me say that after the most careful consideration of the whole matter I have come to the opinion that it is essential that intimation of pregnancy should be made compulsory. Now let us consider the advantages and the disadvantages or objections to such a radical step.

As regards the advantages, I shall merely enumerate them, for they are obvious. (1) Every pregnant woman could be looked after during her pregnancy, and the complications of pregnancy treated at an early stage. (2) Proper arrangements could be made for the woman's confinement and many of the more serious complications of parturition might be prevented. (3) Arrangements for the care of the new-born could be made as regards food and clothing; many infantile deaths could be prevented, and many more children could be started in life healthy and well-nourished.

I might also mention that by this intimation of pregnancy a better control would be exercised over illegitimate births and the places and manner in which they occur.

But naturally the objections concern us most, for, although no possible bodily harm could result to pregnant women from compulsory intimation of pregnancy, they would undoubtedly be put to certain inconveniences.

Now it appears to me that the first objection

which will be urged against intimation of pregnancy is that the private life of the individual would be disturbed. Apart altogether from those who become pregnant although unmarried, and who naturally desire to keep the knowledge of their condition to themselves, there is a considerable number of married women who, from modesty and other feelings, desire to keep the condition secret. One has of course every respect for such feelings, but I am convinced if it were explained to a representative body of women that intimation of pregnancy would be of the greatest possible benefit to all expectant mothers, and particularly young mothers pregnant for the first time; I feel certain that almost without exception they would agree that notification was desirable.

When one looks back upon the various diseases which have become, certifiable—specific fevers, tuberculosis, ophthalmia neonatorum—as each of these have been added to the list there have been protests that the liberty of the subject was being interfered with, that the private life of the individual was being disturbed, that enormous hardships were being placed upon certain individuals. Of course the sentiments and feelings of many were disturbed, and a few may even have suffered bodily harm as well as mental disturbance. But at the present moment would anyone propose that notification of these diseases should be abolished, or that the notification of birth should be abolished? Certainly not, and remember that although pregnancy is a physiological condition, very frequently indeed at the present time from our mode of life and other causes it is not physiological, it is pathological. It may not have its hundreds of thousands of victims, as tuberculosis has, but believe me there are in this country many hundreds, yes, several thousands, of mothers and many more children lost who need not be lost. They are lost because the expectant mother and the parturient succumb to com-

plications which might have been prevented, and the State is responsible for their lives in so far that it fails to make any provision for the prevention of these complications.

Naturally the women who would suffer most are those who become pregnant while still unmarried. Now every possible consideration must be extended to these women. There would be absolutely no publicity given to the woman's condition. As a matter of fact if you had women officials looking after this department much valuable aid might be given to these expectant mothers in their unhappy condition. Besides, in any case, pregnancy will sooner or later intimate itself by the birth of the child. Would it not be much better to have these women cared for in some way, and not permitted to continue concealing their unfortunate condition until the last moment, when mother and child may alike suffer from the concealment?

Another objection which might be urged against intimation of pregnancy is the uncertainty of the existence of the condition in many cases, for it is sometimes very difficult to say whether a woman is pregnant or not. Of course, there are cases of this nature, but there are also many cases in which it is extremely difficult to say whether a patient is tubercular or not or whether a child is suffering from scarlet fever or not. In such cases a diagnosis is withheld until the physician is certain of the condition. As a matter of fact in most cases the intimation of pregnancy would generally be made when the pregnancy had advanced to the sixth or seventh month, and at that stage a diagnosis is seldom difficult.

Other objections might be urged. It might be urged that the work thrown upon the doctors and Public Health Authorities would be too great and that great expense would be incurred. I shall

indicate later how I would propose to get over some of these difficulties. I believe then that the only procedure which will improve the present unsatisfactory condition of affairs is the compulsory intimation of pregnancy. Educating the people, holding of meetings, scattering leaflets abroad, is futile. Again I maintain that the prospective mother should be compelled to intimate to the Medical Officer of Health that she is pregnant. This may be done by herself, her husband, or her doctor, but where the woman or husband make the intimation, the Health Department can only accept that intimation after it has been confirmed by a medical practitioner. When intimation is made the prospective mother must state whom she has decided to have to attend her at her confinement, whether it is to be a doctor, midwife, or an official from the maternity hospital or maternity department of a general hospital. Failure to make intimation of pregnancy must be dealt with, but I would here bring forward a suggestion made by my friend Dr. Chalmers. It is to this effect, that the Insurance Commissioners might be asked to insist that maternity benefit would be sacrificed by those who failed to notify their condition by the sixth or seventh month of pregnancy. Of course provision would require to be made for the exceptional cases in which intimation of pregnancy was impossible.

Apart from the intimation of pregnancy the Public Health Authorities need not exercise any supervision over the women who elect to be attended by a medical practitioner. They will include women of the so-called upper middle and more prosperous working classes. What we must legislate for is the poorer members of the community who elect to be attended by midwives or the officials of a maternity hospital or maternity department of a general hospital.

Let me now indicate how the scheme might be carried out, and to do so I propose to lay before you the arrangements which I think would be suitable for my native city, the city of Glasgow.

We have in connection with the Glasgow Maternity and Women's Hospital a very large maternity service; in 1912 we had 1,459 indoor and 3,001 out-door cases.

In addition we have what is termed the *West End* Branch. This branch is simply a place of call; there is a housekeeper who takes messages and one or two nurses. All the cases in the western district of the city are attended from this branch. Now if we had Southern, Eastern and Northern branches, the different districts of the city would be much better served. To the maternity hospital we send all abnormal cases which cannot be properly attended in their own homes. But our hospital, even if our directors were convinced that it was desirable, cannot at present afford to establish other branches. Here then is where the Public Health Department might be of service, for I would propose that at all of these branches there should be not only a maternity service but there should be an outdoor service for giving advice to expectant mothers and nursing mothers.

At certain hours advice should be given to pregnant women of the district who are ultimately to be attended by midwives or the out-door department of the maternity hospital. If the cases are specially complicated they should be passed on to the Maternity hospital, where they would be seen by the visiting physician in charge and if need be admitted into hospital.

At each branch also advice (*Consultation de Nourrissons*) should be given to mothers as regards the feeding of their infants, and again in any very complicated case the mother and infant should be

sent either to the maternity hospital or the hospital for sick children. These branches should be made the centres for distributing milk.

My proposal then is that these branches should be administered by the Public Health Department and officered by members of the staff of the Maternity hospital and the Public Health Department. By such an arrangement, we would have complete control over pregnant women, nursing mothers and infants.

Another use might be made of these centres. The different charitable institutions for the distribution of clothing and food for the poor could at once get information regarding needy cases.

I feel sure that with slight alterations to suit local arrangements and institutions a scheme of the nature I have sketched might be elaborated for all cities and towns.

As regards country districts with no hospitals the intimation of pregnancy would give the Health Authorities a control over the practice of midwives which would be greatly to the advantage of the community.

Without doubt a scheme on the lines I have indicated will be introduced some day. I trust we will not have to wait too long, for until it comes there is little hope of improving the present unsatisfactory conditions.

Permit me to thank you again for the honour you have done me in asking me to read this paper.

Dr. NAISH (Sheffield) said he would like to thank Dr. Kerr very much for the address he had given them. From another point of view he had been most thoroughly convinced himself of the importance of toxæmias of pregnancy. Dr. Kerr had told them of the enormous mortality which serious toxæmias caused amongst children, and he would like to ask in connection with this how long were the infants followed up? Did such deaths occur before the end of the first day,

or after the first month? Apart from that he had noticed that the minor toxæmias of pregnancy—the ones connected with excessive vomiting—continued throughout the whole pregnancy or a very considerable portion of it, and bad headaches—the history of this kind of pregnancy often occurred in cases in which the infants were found to be marasmic. When they did not actually die at birth they were found to be wasting infants who did not gain in weight. It was a most striking fact that in a great number of these cases the mother gave a history of a very considerable amount of trouble during pregnancy. From that point of view, quite apart from the number of infants that died, he thought the secret of a great number of these wasting infants was trouble during pregnancy. If they were going to advance very much in regard to the prevention of infantile mortality they would have to strike out a new line and take such matters into consideration. The question of the feeding of the child was almost played out. He did not say it had been worked out in a practical way completely, but they were getting towards the end of original work in that respect, and they now wanted to go more thoroughly into the pre-natal condition, which he was glad to say had had so great an amount of attention by that Conference, and specially should attention be called to these so-called toxæmias of pregnancy. The more infants one saw the more striking was it that toxæmias of pregnancy seemed to be the cause of wasting in infants.

Dr. TRUBY KING (New Zealand) said he would like to say a few words in appreciation of what had been said in regard to the question of the toxæmias of pregnancy and the benefit which would accrue if greater care were taken in regard to the mother's health during the period of pregnancy. Of course, there could be no question whatever that by whatever means that was brought about it would be a stupendous benefit to the mothers, and, of course, the object of the writer of the paper was obviously one in the interest of motherhood. He had not to do with the question of the particular classes which the notification suggested would affect. No doubt it would be intended for the class which had least social advantages. But on the other hand he was perfectly certain that such a measure if applied to and found of benefit to one class would also become the order with regard to the other classes. He meant to say that it would impress upon the community the enormous importance which attached to the proper care of the mother and the child long before the period at which the child was born. The observations made in connection with one of

the leading maternity hospitals in New Zealand had, he thought, an important bearing on what had been said. It was there found that where mothers were unable to nurture their offspring, on looking back on the records it was discovered that in these cases almost without exception the mothers had been sufferers from albuminuria. In other words, it not only caused certain risks with regard to their lives, but it also manifested itself in this most important direction, that it limited the ability of the mothers to nourish their offspring. Of course, they knew this must be the case. Anything which interfered with nutrition in this way was liable to render the mother unable to suckle her child. It was another direction in which education, whether arrived at by notification or otherwise, would greatly redound to the benefit of the mother and child. He might say that he was speaking of a country where they had not the submerged conditions in the same way as they had in Great Britain, and therefore advice had to be sought in a voluntary way, but still they found there was a growing appreciation and a growing tendency on the part of expectant mothers to come forward in order to gain the information which was so important. He had received a letter since coming to that Conference from one of their branches which read: "Greatly increased number of expectant mothers now consult the Plunkett nurses and send for the Society's publications, before the arrival of their babies." He was quite sure that Dr. Kerr would not suggest that the seeking of advice upon rational lines or the provision of such advice would not be beneficial. He largely agreed with Dr. Kerr with regard to the distribution of small leaflets which had a few instructions on them not as a rule greatly impressing people. As to the mother objecting, he quite agreed with Dr. Kerr that if the matter were properly and reasonably explained to the mothers, and if they were brought to realize that the matter was entirely in their own benefit, any opposition which might be raised in the first instance would soon be allayed, and that they would soon come to recognize what an enormous benefit had been conferred upon them and that it was a provision entirely in their own interests. If one could get a general knowledge of the cases where there was pregnancy it would be one of the greatest of all possible measures of safeguarding the child from every possible point of view, because it would not only obviate the dangers, but it would very greatly increase the physiological capacity of the mother to provide a natural food for her offspring, which after all stood at the head of all consideration in this direction. If it could come

within the sphere of practical politics then he thought the proposal was a most beneficial one, and in any case it was a desirable proposal to be made, because no doubt in the near future it was one of those things which must be brought about.

Dr. KERR, in reply, said he absolutely agreed that it would be very desirable to have a voluntary notification of pregnancy, and he had no doubt that a very considerable proportion of women would come and consult their medical men if it were impressed upon them that it was necessary to do so, but they had always to remember that there was an enormous number of individuals who did not take any care of to-morrow but just lived from hand to mouth as regarded health, and he consequently thought that in order to reach these poor members of the community it was absolutely necessary that something in the nature of an intimation of pregnancy should be made compulsory. He might have referred to several other diseases of toxæmias of pregnancy. They were often very insidious and did not manifest themselves in the grosser form of convulsions or albuminuria, and as a matter of fact a woman during pregnancy should be carefully looked after, certainly from the third or fourth month on. Lastly, it was a matter which concerned women themselves and he had the greatest confidence in placing the matter before women. He had the greatest confidence that if the matter were put before a body of women, and it was explained that it would be greatly to their advantage and greatly to the advantage of their poor sisters to have this intimation of pregnancy, then the wealthiest and the most leisured would immediately say: "We are quite willing that this should be made compulsory, although, of course, on many occasions we wish to keep the matter really to ourselves." He felt certain that one day this intimation of pregnancy would be the law and he hoped the members of the Conference would try and help it forward.

The following paper by Dr. J. L. Huntington was read by Dr. R. Green.

RELATION OF THE HOSPITAL TO THE
HYGIENE OF PREGNANCY.

By JAMES LINCOLN HUNTINGTON, M.D.,

Boston, Mass.

It is the object of this paper to show the development of a pregnancy clinic, which is an active part of a lying-in hospital, in a larger medical school centre; to show exactly what this institution is and what results have been obtained, and to show the cost of such an institution and its running expenses.

I wish also to show by what means even better results might be obtained in a more nearly ideal pregnancy clinic in connection with a modern lying-in hospital.

To show the various steps in the development of the work done at the Boston Lying-in Hospital in connection with the hygiene of pregnancy it is necessary to go back to the starting of the out-patient service in 1881. Through the firm establishment of this department and the careful supervision of the work, not only of the students, but also the supervision of the work done by the house officers by specialists in obstetrics, a splendid record has been established, and now some two thousand women are cared for in their homes every year by this department of the hospital.

The Instructive District Nursing Association began making ante-natal visits on some of the women in the out-patient department of the Boston Lying-in Hospital in 1901. The work gradually spread until in 1906 all these women were paid at least one visit by a nurse from this association some time between the date of application to the hospital and the confinement of the patient. Last year this association averaged about three ante-natal

visits on each patient of the Boston Lying-in Hospital, out-patient department.

In 1909 Mrs. William Lowell Putnam, of the Infant Social Service Department of the Women's Municipal League of Boston, began the experiment of intensive pre-natal care of the patients registered at the Boston Lying-in Hospital, later to be confined in the hospital itself. These patients were visited by the nurse every ten days. This work was so successful and the need for this work so clearly demonstrated that in May, 1911, the pregnancy clinic of the Boston Lying-in Hospital was opened for patients.

The quarters of this department are in a tenement house almost opposite the main entrance of the lying-in hospital. It is a typical four-roomed apartment and rents for \$300 a year. The kitchen is the laboratory and waiting-room. The large front room is the office and an alcove screened off is used for an examining room. The adjoining room is the main waiting-room and the back room beyond the kitchen is used for the palpation of patients. It has not been considered advisable to have all the women cared for by the hospital patients in this pregnancy clinic, but all who apply for confinement in the hospital are referred to the pregnancy clinic for examination and treatment unless within four weeks of term.

The patients planning to be confined in their homes, however, come directly to the pregnancy clinic, and remain under the care of this department until they start in labour, unless some serious complication arises which makes treatment in the hospital desirable. It is not true, however, that all the out-patients of the Boston Lying-in Hospital are patients of the pregnancy clinic, for in another section of the city is the branch station of the lying-in hospital, and as its patients live so far

away from the hospital, it has not been considered good policy to require all these prospective patients to come to the pregnancy clinic. These patients are visited by the nurses from the Instructive District Nursing Association, and should any complications arise they are referred to the pregnancy clinic, so in this way there is some supervision of the hygiene of pregnancy of all the 2,000 patients now delivered annually in the out-patient department of the lying-in hospital and of nearly all the 900 patients that apply to the hospital for confinement within that institution.

Let us follow a patient through the course of her care in the pregnancy clinic. We urge the patients to come as early in their pregnancy as is possible, but as a matter of fact, few apply before the fifth month, and most of them some time between the sixth and seventh months. The history of the patient is taken, both social and clinical, careful stress being laid on the previous obstetrical history. Should the patient have passed successfully through one or more confinements with normal labour, she is sent into the back room for physical examination. The physician examines the urine, and takes the blood-pressure. The abdomen is examined, the probable date of confinement estimated. If pregnancy has developed sufficiently far, the foetal heart is examined and the pelvis is carefully measured. The patient is given careful directions as to the hygiene of pregnancy, and is told to return in four weeks or sooner if any untoward symptoms arise. The name is then given to the nurse who makes the follow-up visits. The out-patients are visited in their homes at regular intervals by the nurses of the Instructive District Nursing Association. Many of the patients that are to be confined in the hospital are visited, however, by the nurse who is on duty in the pregnancy clinic,

and this is the ideal arrangement for the best kind of service.

Should, however, the patient give a history of previous difficult labour, or should she be a primipara, she is referred to the front room, and a careful vaginal examination is added to the examination previously described. Should the pelvis show marked contraction and the patient be nearly at term, she is sent to the hospital for consultation. Should a patient show albumin in the urine or a high blood-pressure, if the symptoms are acute, she is sent to the hospital for treatment. If the symptoms are mild, she is told to return to the clinic for examination in three days, in five days, or at the end of a week, depending on the severity of the symptoms.

When the patient returns for her subsequent visits her urine is examined and her blood-pressure taken.

To show the work that we are doing, I have carefully reviewed the records of 1,000 cases, beginning with the first case that made application after the present system was fully established.

Of this series 609 cases were delivered in the patients' own homes by student externes and the out-patient staff of the Boston Lying-in Hospital. Two hundred and thirty were delivered inside that hospital by the house staff.

Turning to the 609 cases delivered in the out-patient department, 608 were married and one only was single; 157 were pregnant for the first time, while 452 had had one or more previous pregnancies; 545 had normal deliveries. The average length of time that the mothers were under the care of the out-patient department after delivery was twelve to seventeen days; 600 mothers were discharged well.

The infants were under the care of the out-patient department for an average length of time of twelve to nineteen days. Five hundred and seventy-six were discharged well. There were fourteen still-

births. Six died from other conditions. This would give a rate per 1,000 births of 22·9 stillbirths, which compares favourably with Boston's rate of 39·8 and Borough of Manhattan's 48·6.

As this paper is limited in length, I will not go fully into the statistics of the patients delivered in the hospital, but I feel obliged to state that this rate of stillbirths is not so satisfactory. The total for all these 839 cases delivered in the hospital and the out-patient department combined is 35·3 per 1,000 births. Three patients seen in pregnancy clinic subsequently developed eclampsia in the hospital, and one of these died. None of these three showed any symptoms of toxæmia while under observation in the pregnancy clinic.

On the other hand the seventeen cases showing symptoms of toxæmia and referred to the hospital escaped without serious trouble. It is only fair to state that of these 230 cases followed by the pregnancy clinic, for various reasons only sixty-five were visited by the pregnancy nurse.

On the previous pages I have described in detail the workings of an actual institution and the results obtained. Now I want briefly to sketch a more nearly perfect system. In this ideal pregnancy clinic all patients should apply without reference to the subsequent confinement, being guided as far as they are willing by the physician in charge. The nurse who receives the patient and assists the physician in making the examination should be in each and every case the nurse who will make the follow-up visits. This nurse should be trained to take the blood-pressure and make the nitric acid test for albumin, and carry with her on her visits to the patient's home the necessary apparatus for taking these observations. From the date of application the patient should be visited by the nurse or report to the clinic at least every two weeks. Patients failing

to report at the clinic should be traced by the nurse. All patients when applying to the pregnancy clinic should be given a complete physical examination. In the clinic the urine examination should include an examination of the sediment in every specimen showing albumin by the heat test. Such an ideal pregnancy clinic must be associated with a hospital providing beds and adequate obstetrical care for the graver complications of pregnancy and for operative obstetrics. It should also be associated with an outpatient service providing care for patients in their own home. What would be the estimated cost of such an institution, exclusive of the care of confinement and puerperium or the services of the physician during pregnancy? We have found the rental of the necessary quarters to house such an institution would be \$300 per year; the initial expense of fittings and office furniture \$100. This clinic would require three nurses to make the necessary visits. If living in the hospital provided, such nurses could be obtained in Boston for \$500 a year. Car fares for one nurse in 1912 amounted to \$40.10; gas for heating water and lighting in winter cost \$38.80; the services of a maid to clean the rooms cost in 1912 \$42; stationery, drugs, and instruments cost \$120.75. So the total cost of such an institution caring for 2,000 cases annually would be \$2321.55 for the first year and \$2221.55 for subsequent years, as the wear and tear of office fittings is slight. Thus with each patient paying \$1.16 the thing could be accomplished. It would seem that for a practically nominal cost to the individual the hygiene of pregnancy could be supervised intelligently in any community offering over 500 pregnancies for observation annually.

Dr. R. GREEN (United States) said he was more inclined to look at the question from the mother's point of view. He could see that there were certain important things which supervision of pregnancy could do for the mother, and by

looking at it from her point of view they were looking at the interests of the unborn infant. It seemed to him there were three things which a careful supervision of the pregnant mothers could do. In the first place, such a careful supervision could to a large extent prevent the bad results of toxæmias of pregnancy. They knew that to be true, and in doing that they were not only saving infantile lives, but the lives of working mothers who had families to support and who were the potential mothers of other children. The second thing he thought they could do was to treat the definite diseases of the mother, and the most prominent amongst these he should place syphilis. There had been some difference of opinion in the morning session as to how important syphilis was as a cause of infantile mortality. Without citing figures he could cite a certain case of a mother aged 40, pregnant for the seventh time, and who had had six premature births due to syphilis. She was very anxious to have a living child, and she came to their clinic. They found that the woman had had syphilis, and she was carefully treated, and gave birth to a 9 lb. baby at full term. That was one instance of a great many others in his mind which he could give. Thirdly and most important was the work they could do in the education of the mothers and of the community. That was done partly by the doctor in the clinic, who laid down the law categorically as to what the mother should do, and still more was it done by the visiting nurse, who went round to the houses and saw that the patients followed the instructions they received. What was best for the patient came under certain definite heads of fresh air, clothing, diet—and let him remind them that diet was a tremendous item. In his country there were a great many more patients who ate too much or who ate unwisely than there were patients who were underfed. When there were patients underfed he believed, from his experience, that the reason was almost always because there was a man in the household who was drinking away the money. There was food enough for everybody, and money enough to buy it, if it were not spent in some other way. Personally, he believed that the problem of alcohol in his country and in many others was vastly more important than any other thing they had to deal with so far as securing the well-being of the future generation was concerned. Education, then, with regard to fresh air, clothing, diet and exercise could be carried out by the visiting nurses in the homes and by the hospital nurses. They were believers in the leaflet method of disseminating information. They had a column in one of their daily papers with regard to the

hygiene of pregnancy which was written by Dr. Huntington, and personally he believed very emphatically in that method. After all, for better or worse the daily papers were the things the people read, and it was a great deal better for them to read articles about medical subjects like syphilis and the hygiene of pregnancy written by physicians than it was to read medicine advertisements. There was a line which occurred to him by their poet, Rudyard Kipling—for he called him equally their poet:—

“ You can lighten the curse of Adam when you
lighten the curse of Eve.”

In this matter of pregnancy they could lighten the curse of Eve, and whatever they could do in this way was going to be good not only for the mothers, but for the children and for the community at large.

Dr. TRUBY KING (New Zealand) said he entirely agreed with Dr. Green in regard to instructions being given by leaflet if the term were used in the way he applied it. When small leaflets were scattered about broadcast, with everything compressed in a small compass, people did not keep them and pay much attention to them; but with regard to consistent articles appearing week after week in the public newspapers by authorities and such as could be comprehended by anybody, then he had no doubt as to the enormous benefit. It was one of the main means which they had employed in New Zealand, and he could speak from personal experience of this over a period of five or six years. Almost every woman in the country came to read these articles who was interested in the problem of childhood. If those were the kind of leaflets Dr. Green had referred to, written simply and on lines which the mother could understand, then he had no doubt that they were of immense benefit to the community. As to the school for dealing with people in connection with pregnancy and advising them on the subject, unquestionably it was a most enlightened proposal, and one which could only be attended with the greatest possible benefit to the women. He was glad to hear that something had been so consistently carried out in America.

Dr. BEATRICE MACGREGOR (Wimbledon Mothers' and Babies' Welfare Society) said she would like to say a word on the subject of leaflets, because she thought they could be of great benefit in this way. At Wimbledon she gave personal instruction to mothers, and they sent their health visitors to visit in the homes to try and teach them some lessons week by week. But their memories were short, and they found it was a very useful thing, in addition to

their personal lessons, to have also the lessons printed in a short, concise form, which the health visitor could leave for the mother to read. Further than that, it enabled the wife to interest the husband in the lesson she was learning.

Dr. ADAMSON said he endorsed what had been said about the importance of teaching the mother at an early date what to do during her time of trial, but he thought there was one aspect of the subject which had to a certain extent been overlooked. In the toxæmic conditions they so often found that both mother and child were sacrificed. It might be the first baby, and it might be the second, third or fourth baby, and if the mother died she left behind her a young family. It was essentially a social question, and he asked them what chance had the children left alone to be brought up of being good citizens without a mother's care and thought. To him that consideration was a most momentous one. He had called attention to it time after time in his reports, and he was glad to say that for the last six years he had never once had a death from puerperal fever. It was their duty to go on with this work, and if they failed, then let them try again and again.

THE IMPORTANCE AND PREVENTION OF EAR DISEASE IN INFANCY.

By MACLEOD YEARSLEY, F.R.C.S.

Senior Surgeon to the Royal Ear Hospital; Otologist to London County Council Deaf Schools, &c.

This was not read in his absence for want of time.

My first duty is to offer you my thanks for permitting me to contribute a paper to this Conference. You are dealing with a great question, the prevention of infant mortality and the welfare of infancy, and the work upon which I have set my heart is one in which we can be mutually assistant. I am at present helping, to the best of my ability, to promote a great movement, the prevention of deafness, initiated by the National Bureau for Promoting the General Welfare of the Deaf. This movement is one in which you can co-operate, for its success will be of material

assistance to the realization of the excellent aims which this Conference has in view.

Those concerned with the prevention of deafness find themselves confronted with a double problem: the prevention of congenital deafness and that of the acquired form. The former is, perhaps, the more difficult task, but it is one which will have to be faced in the near future, and I do not propose to deal with it upon this occasion. The prevention of acquired deafness is, at present, much more within the range of practical politics and will form the subject of this short paper. If we are to be successful in the prevention of acquired deafness in the adult, we must attack it in the child, and to be successful in the child we must attack first causes in the infant. The child we can reach now through the school, the infant before school age we must get at by such organizations as yours.

Nearly all cases of deafness in infancy and childhood are caused by one of three great groups of causes: the infectious fevers, meningitis, and primary ear disease. Among the first-named, scarlet fever, diphtheria, measles, and congenital syphilis are the most responsible. Reference to the Annual Report of the Metropolitan Asylums Board for 1911 shows (pp. 118 to 120) that, during that year, ear complications occurred in the following percentages: scarlet fever, 11·42; diphtheria, 5·38; measles, 14·10; whilst enteric fever and whooping-cough were 3·5 and 4·9 respectively. These aural complications of the exanthemata are always serious and always dangerous. They not only destroy hearing, but they tend to kill, although a fatal result may be delayed for years. Their treatment taxes the skill of the otologist to the utmost, but by timely care and prompt intervention they can be prevented. The medical officers of fever hospitals are all good men, but they cannot know everything, they cannot be

specialists in every complication they are called upon to deal with. What is wanted is the appointment of otologists to fever hospitals; we of the National Bureau are of opinion that a great deal could be done for the prevention of deafness from the exanthemata if this suggestion were carried out, and I have excellent reasons for believing that such appointments of specialists would be welcome to medical officers of fever hospitals.

With regard to congenital syphilis, I will merely point out certain cogent facts. It has been said that no disease, even tuberculosis, is so destructive of child life or so disastrous to child health as is congenital syphilis. It causes the most serious cases of blindness and deafness during and after school life, not to mention epilepsy and mental defects. Kerr Love has shown that a very appreciable number of cases of congenital deafness is due to it. Now, it was proved some years ago by Cheatele that the cases which become blind or deaf are those in which the disease was untreated in infancy. Surely the time has come for the more universal treatment of this terrible condition, and in order to facilitate such treatment of both mother and child, every case should be notified.

Let us take meningitis, which is another great cause of deafness in children. It is a condition which kills or maims thousands of children every year, and yet our knowledge of its true nature is at about the same stage as was that of typhus and typhoid seventy years ago, save that we have the advantage of the discovery of the bacterial nature of disease. Meningitis is due to many causes; what is required is research to elucidate these causes, what they are and how they act. Such research could best be obtained by the notification of all forms of meningitis, to the end that they might be isolated, studied, treated. Could we but learn more of the etiology of meningitis,

we could prevent it, and by preventing it we could prevent the deafness which it often causes.

Lastly, there is the deafness caused by primary ear disease. This is, in almost all cases, the result of adenoids, either immediately or remotely. We otologists see daily patients who are hopelessly deaf from this cause ; we can do little or nothing for them, they are handicapped severely in social and in civic life, but they could have been prevented from becoming deaf. When they become deaf during school life, they require active treatment, to be carried out in school clinics or treatment centres. In this regard, I wish to emphasize the fact that, to be efficient, this treatment must be in the hands of specialists. Otology has grown to be a very special branch of surgery, requiring special skill, training and experience ; hence the National Bureau insists that all aural school clinics and treatment centres should be under specialists or at the very least under specialist supervision.

There is, however, another point. I have said that in the great majority of these cases the primary cause is adenoids. What we have to do is to prevent adenoids. What are the factors in operation to cause this hypertrophy of the lymphoid tissue in the nasopharynx ? It is due to bacterial infection, either by a common cold or by some specific fever. Much could be done to prevent this infection by improvements in the hygiene, in the feeding, and in the housing of infants and, no doubt, much has been done. The better the infant is nourished, clothed, and cleansed, the better able it is to resist bacterial invasion. I believe that overcrowding, especially in cases where the whole family has to live and sleep in one, perhaps not overclean, apartment, is a potent factor. Barraud, of Lausanne, has pointed out that the improper artificial feeding of infants is an important cause of adenoids, and I am sure that that most pernicious accompaniment of infancy, the misnamed "comforter," has

much to do with the conveyance of bacterial infection. This is a problem which has to be faced by the hygienist and the social worker. They must reach the mothers and teach them; the latter are always willing to learn and to practise, once they realize that the welfare of their children is the one and only object of such teaching.

In conclusion, let me recapitulate to you the suggestions which I have outlined and which have been drawn up, by the medical committee of the National Bureau, for the prevention of acquired deafness. They are:—

(A) The prevention of the diseases which cause deafness.

(1) Notification of all forms of meningitis for isolation, treatment and research.

(2) Notification of all cases of congenital syphilis with a view to facilitating treatment of mother and child.

(3) Improvement in hygiene, housing, and feeding of children in the first years of life.

(B) The better management of ear disease when it occurs.

(1) The appointment of otologists on the staff of every fever hospital.

(2) All aural school clinics and treatment centres to be under a specialist or specialist supervision.

I lay these suggestions before you, confident that you will discuss them impartially and accord to the National Bureau your valuable support and assistance in furthering the great work upon which we are engaged. If you can see your way to forwarding a resolution or resolutions to the authorities concerned, we shall be grateful.

The CHAIRMAN, in declaring the Session at an end, said the whole ground had not been covered, but still he thought they could leave the section feeling that a very great deal had been done.

JOINT MEETING OF THE ADMINISTRATIVE AND
MEDICAL SECTIONS.

A Joint Meeting of the Administrative and Medical Sections was held on the afternoon of Tuesday, August 5, to conclude the official business of the Conference, and to confirm resolutions submitted by the Executive Committee.

Alderman BENJAMIN BROADBENT (Huddersfield), who presided, said: I want to make it as clear as possible what the function of this closing meeting of the Conference really is. The Executive Committee has very carefully watched the proceedings of the Conference, and they have drafted a number of resolutions which they think express with practical unanimity the findings of the Conference upon the various matters which have been brought before it. It will be quite impossible to discuss these resolutions at this meeting. They must be either adopted with sufficient unanimity to make us feel that we have the support of the Conference, or else they will have to be dropped. That is to say, if there is not unanimity we should not have sufficient force behind us to go to the various Government offices and say to the heads of the departments: "These resolutions are the resolutions, practically unanimous, of an English-speaking Conference, and we present them as such to you for you to carry out in your executive capacity." There can be no discussion upon the resolutions. They will be read out to you for your consideration. If you agree with them with practical unanimity they will go forward; if you cannot agree to them with practical unanimity, then we shall have to await another conference before we can carry them any further. I think that makes the matter quite clear in regard to the position here at this meeting. (Hear, hear.) The first resolution is: "That this Conference urges that the Maternity Benefit be made the property of the mother, both in practice and in law." Is that resolution agreed to? (Cries of "Agreed.") Are there any to the contrary? That resolution is carried with absolute unanimity. The second resolution is: "That in view of the damage liable to be wrought in growing girls by injudicious stress of education, especially during puberty and adolescence, this Conference feels bound to deprecate any form of education for girls which pays insufficient attention to establishing good bodily health and development and complete fitness for maternity and the practical care of a home." (Cries of "Agreed.") That resolution is carried unanimously.

Dr. PORTER (Marylebone) asked where the resolutions would be sent to.

The CHAIRMAN: If the Conference adopts them they will go back to the Executive Committee. The Executive Committee will then deal with them as orders given by this Conference. They will take them to whatever Government department, or whatever Government official, or whatever authority the Executive Committee may think most likely to carry them into effect. The Executive Committee will approach that authority, and will endeavour to get them to carry the resolutions into operation.

The third resolution is: "That this Conference urges upon the Government the necessity—in the interests of both mother and child—of legislating for the registration of stillbirths." Is that agreed? It is carried with unanimity. The fourth resolution reads: "That this Conference urges upon the Government the necessity for the more complete medical certification of death, and that the medical death certificates should be forwarded to the registrars as confidential documents under sealed cover." Do you agree to that? (Cries of "Agreed.") That is carried.

Resolution five is as follows: "That the time has arrived for steps to be taken with a view to securing the better training of women who apply for the certificate of the Central Midwives Board."

A DELEGATE asked whether the resolution meant that midwives were to undergo a much stiffer examination than they had to pass at the present time.

The CHAIRMAN: It is beyond our powers to give a definition at the present time. If we desire midwives to be better qualified, this resolution says that the time has come for steps to be taken with a view to securing their better training.

Another DELEGATE asked whether it was the idea of the Medical Section of the Conference to push this matter to the point of improving the midwives out of existence as one of the speakers said the previous day. (Cries of "No.")

The CHAIRMAN: It is for the improvement of the training of midwives; that is the purpose of this resolution. I will now put the resolution. It is carried.

The CHAIRMAN then submitted the three following resolutions, which were also carried unanimously:—

"That this Conference requests the Executive Committee to communicate with the General Medical Council and the degree and licence conferring bodies with a view to infant hygiene being given a more important place in the medical curriculum."

"In view of the large percentage of stillbirths and infant deaths directly attributable to venereal diseases, and con-

sidering that infant blindness and other congenital defects are in many cases due to the same cause, the English-speaking Conference on Infant Mortality urges the respective Governments of the countries therein represented each to appoint a Commission to inquire into the causes and prevalence, the provision of treatment, and the possibility of the prevention of these diseases."

"That the attention of the Board of Education be drawn to the extreme desirability of making the grant earned by 'recognized' Infant Welfare Centres depend in future on their efficiency, on the number of registered attendances of the mothers at consultations, classes and talks; and on the number of home visits paid under adequate supervision."

Dr. CHALMERS read the following resolution: "That it be referred to the Executive Committee to take whatever steps are necessary in order to secure that no microscopical examination of milk for tubercle bacilli, provided it is negative, be accepted as final without confirmation by inoculation tests." Dr. Chalmers said the resolution was submitted because it was argued that in many parts of the country it was sufficient to microscopically examine a sample of milk and to declare it free from tubercle bacilli. The suggestion of the Executive Committee was that they should consider what steps should be taken to ensure that an opinion of that sort should invariably be supported by inoculation tests.

The resolution was carried.

The CHAIRMAN: I think a further resolution might be submitted following on the discussion in regard to the question of the milk supply. The Milk Bill has been before us, so to speak, for a great number of years, and I am afraid that it has been so often before us that we can hardly believe that it will ever actually become an Act, but I think that this Conference should pass a resolution urging that the Milk Bill should be presented to Parliament, and passed with as little delay as possible. Is it the wish of the Conference that we pass such a resolution?

A DELEGATE said he would like to ask the Chairman whether he could inform the Conference as to why a non-contentious measure of that sort should be withdrawn. Quite obviously it ought not to be contentious, for surely Liberal, Tory, and Socialist all agreed that we ought to have pure milk. Having arrived at that point, he would like to know why the Government had had to abandon the measure this year.

The CHAIRMAN: It is quite beyond my province to answer that question. All we can do is to pass a resolution which

will, I hope, strengthen the hands of those who mean this Bill should actually come into being and become an Act. If it is the wish of the Conference, will you kindly say so? (Cries of "Agreed.")

The resolution was carried unanimously.

Alderman S. CRESSWELL (Wandsworth) said that he wished to submit a resolution with regard to the question of measles.

The CHAIRMAN: That is out of order; though it is a matter of very considerable interest, it can hardly come within the scope of the present Conference. I will read the resolution to the Conference which Mr. Cresswell wishes to propose, but it hardly appears to me that it is quite germane to the present procedure, and I am afraid that when I have read the resolution I shall have to rule it out of order, but still I will read the resolution, as it is on a very important subject. It reads: "That in the opinion of this Conference it is of vital importance to the nation that scientific and medical research be instituted with regard to the cause and prevention of measles, and as to the possibility of rendering children immune from such disease." I have read the resolution to you. I assure you it has a very large measure of sympathy so far as I am concerned, and I believe there are good reasons why this investigation should take place, but I am afraid I must rule that the resolution is out of order.

Alderman CRESSWELL said that before the Chairman ruled his resolution out of order he would remind him that he had just accepted a motion from Dr. Chalmers. He (the speaker) was not asking the Conference to take any operative action, but simply to refer the question to the Executive Committee. Surely the Conference had issued Standing Orders to its representatives. He held that a Conference of this character should issue Standing Orders, so that any delegate attending and feeling very strongly about any subject should have an opportunity of placing a resolution on the paper. He had been hunting about for the past two hours thinking he would be able to get hold of someone to submit his resolution to, and as he was willing that it should be simply referred to the Executive Committee, he did appeal to the Chairman that he would let that Conference of representatives decide whether it was of sufficient importance to be referred to the Committee. Might he take it that the Chairman would allow him to put the resolution to the meeting?

The CHAIRMAN: If I allow this to be in order in one case, I should lay myself open and the whole of this Con-

ference open to any number of resolutions upon any manner of subject. But I can promise this, that whenever (and I hope it will be next year) this Conference meets again I hope we shall be able to give an opportunity for a more ample discussion than has yet taken place on this particular subject and for a resolution upon the subject, but at the present time I am afraid I must rule that the resolution is out of order.

Alderman CRESSWELL: Will you take the resolution yourself, sir, seeing that you have taken such an interest in infant life and infant mortality? Will you take the resolution to the Executive Committee?

The CHAIRMAN: Is that a personal appeal?

Alderman CRESSWELL: Yes, to you, having taken such an interest in child life that you will bring it before the Committee. I feel most strongly about it. Ten thousand lives a year are going and 200,000 cases. You spend thousands and thousands to kill the fly in Africa. (Cries of "Order.") Will you take this resolution to the Executive Committee?

The CHAIRMAN: With regard to what the speaker has said, as far as I am personally concerned, I will take care that this subject is brought before the Executive Committee. That I can do; but as Chairman of this meeting I must rule any resolution out of order. It is quite clear in the circulars which you have all received what the procedure is, and I think that I must adhere to the rules laid down upon the matter. As an individual I am free; as Chairman of this meeting I am not. I am bound by the rules that the Committee has laid down.

One of the matters that we must not pass by is that the City of Westminster has given to us for the last four days complete possession and use of these rooms entirely free of all expense. Can we do less than thank them? (Cries of "No.") I propose that the sincere thanks of this Conference be given to the City of Westminster for their kindness in letting us have the use of these premises.

The resolution was carried with acclamation.

The CHAIRMAN: That vote shall be conveyed to the proper quarters. There is another vote which Dr. Saleeby will propose, but before he does so I wish to say one thing in regard to this Conference. Those who have attended must feel repaid for any sacrifice of time or money or expense, either on their own behalf or of those they represent, in coming to this Conference. The interest of the Conference appears to me to have begun with the first two minutes of it and I think has lasted up to what I believe

will be the last five minutes of it, and such a Conference as this, I believe, will have an enormous effect in promoting the cause that we all have at heart—the life and health and welfare of infancy and of childhood. All those who have been here and have heard especially the strange news that we have heard from across the seas, from our own Dominions and from the United States—the examples that they have shown to us and the teachings that they have given to us—will agree that they must have a most stimulating and most invigorating effect upon everyone who is interested in this cause. For myself, the Conference has been most illuminating and most interesting and I hope the effect of it will prove permanent.

Dr. C. W. SALEEBY said he had to ask the meeting to give a hearty vote of thanks to Their Majesties the King and Queen (Patrons of the Conference), to Mr. John Burns, the President; to Alderman Broadbent, Chairman of the present gathering; to the various chairmen of the sessional meetings, to the readers of papers, to the delegates from the United States and from the Colonies, to the Duchess of Marlborough for her kind reception of the Conference, to the authorities of the various institutions which the delegates had visited, to the gentlemen of the Press for the way they had treated them in the newspapers, to the honorary secretaries of the Conference, and last, but by no means least, to the invaluable Secretary of the National Association, Miss Halford. He would not ask for a seconder as he was sure they would carry the resolution with acclamation. (Applause.)

The resolution was carried with enthusiasm.

The CHAIRMAN: We have received an invitation from Liverpool to hold a Conference there next year in September or October, and I hope that all who have enjoyed the present Conference will reserve themselves for an equal measure of enjoyment and profit at Liverpool in the year 1914. Till then we must say good-bye, hoping once more to meet again.

The Conference then terminated.

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